DK1910SI & DK1930SI

DK1810SI & DK1830SI

& DK1840SI

service manual

Catalog

Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD players, he should pay special attention to the power board with 220V AC and 330V DC which will cause hurt and damage to persons!

1.1.2 Precautions for antistatic

Movement and friction will both bring static electricity which causes serious damages to integrated IC. Though static charge is little, when a limited quantity of electric charge is added to large-scaleintegrated IC, as the capacitance is very small in the meantime, now the integrated IC is very much easy to be struck through by static electricity or the performance will decrease. Thus static electricity prevention is of extraordinary importance. The following are several measures to prevent static electricity:

1. Use a piece of electric conduction metal with the length of about 2 metres to insert into the earth, and Fetch the lead wire from the top of the surplus metal and connect to the required static electricity device. The length and depth of the metal embedded under the earth should be determined according to the wettability of the local soil. For humid places, it may be shorter, and longer and deeper for dry places. If possible, it can be distributed and layed in terms of “#” shape.
2. On operating table-board, the antistatic table cushion should be covered and grounded.
3. All devices and equipments should be placed on the antistatic table cushion and grounded.
4. Maintenance personnel should wear antistatic wrist ring which should be grounded.
5. Places around the operating position should also be covered with electric conduction cushion or Painted with antistatic paint.

1.1.3 Precautions for laser head

1. Do not stare at laser head directly, for laser emission will occur when laser head is working, which will Hurt your eyes!
2. Do not use wiping water or alcohol to clean laser head, and you may use cotton swab.

1.1.4 About placement position

1. Never place DVD player in positions with high temperature and humidity.
2. Avoid placing near high magnetic fields, such as loudspeaker or magnet.
3. Positions for placement should be stable and secure.

1.2 Maintenance method

1.2.1 Visualized method

Directly view whether abnormalities of collision, lack of element, joint welding, shedding welding, rosin joint, copper foil turning up, lead wire disconnection and elements burning up among pins of elements appear. Check power supply of the machine and then use hands to touch the casing of part of elements and check whether they are hot to judge the trouble spot. You should pay more attention when using this method to check in high voltage parts.

1.2.2 Electric resistance method

Set the multimeter in resistance position and test whether the numerical value of resistance of each point in the circuit has difference from the normal value to judge the trouble spot. But in the circuit the tested numerical value of resistance is not accurate, and the tested numerical value of integrated IC's pins can only be used for reference, so the elements should be broken down for test.

1.2.3 Voltage method

Voltage method is relatively convenient, quick and accurate. Set the multimeter in voltage position and test power supply voltage of the player and voltage of a certain point to judge the trouble spot according to the tested voltage variation.

1.2.4 Current method

Set the multimeter in current position and test current of the player of a certain point to judge the trouble spot. But when testing in current method, the multimeter should be series connected in the circuit, which makes this method too trivial and troublesome, so it is less frequently used in reality.

1.2.5 Cutting method

Cutting method should be combined with electric resistance method and voltage method to use. This method is mainly used in phenomena of short circuit and current leakage of the circuit. When cutting the input terminal voltage of a certain level, if voltage of the player rises again, it means that the trouble lies in this level.

1.2.6 Element substitution method

When some elements cannot be judged good or bad, substitution method may de adopted directly.

1.2.7 Comparison method

A same good PC board is usually used to test the correct voltage and waveform. Compared these data with those tested through fault PC board, the cause of troubles may be found.

Through the above maintenance method, theoretical knowledge and maintenance experience, all difficulties and troubles will be readily solved.

1.3 Required device for maintenance

◆ Digital oscillograph (⩾100MHE)

◆ TV set

◆ SMD rework station

◆ Multimeter

◆ Soldering iron

◆ Pointed-month pincers

◆ Cutting nippers

◆ Forceps

◆ Electric screw driver

◆ Terminals connecting cord

◆ Headphone

◆ Microphone

Chapter Two

Functions and Operation Instructions

2.1 Features

Formats:

#Digital video playback of DVD-Video, Super VCD and VCD formats
#MPEG-4 compatibility: playback of DivX 3.11, DivX 4, DivX 5, DivX Pro and XviD formats
#Playback of music discs in DVD-Audio format
#Playback of musical compositions in CD-DA and HDCD formats
#Playback of compressed musical files in Mp3 and CD+G formats
#Playback of Karaoke-discs in DVD, VCD and CD+G formats
#Playback of photo albums, recorded in Kodak Picture CD and JPEG digital formats

Audio:

#192 kHz/12 bit audio D/A converter
#Coaxial and optical audio outputs, providing digital sound playback in Dolby Digital/DTS/LPC formats
#Coaxial and optical audio inputs, providing connection of external digital signal sources
#Stereophonic audio output for connection to TV and amplifier
#Integrated digital multi-channel sound decoders, providing playback of Dolby Digital and DTS audio tracks
#Integrated Dolby Pro Logic II decoder, providing transformation of stereophonic signal to multi-channel one
#Microphone input providing karaoke functions
#Headphones output

Video:

#108kHz/12 bit video D/A converter
#Progressive scan(Y Pb Pr)video signal output, securing high resolution and absence of image flicker
#Composite and component(Y Cb Cr), S-Video and RGB/SCART video outputs, providing advanced switching capabilities
#NTSC/PAL transcoder
#Support of many camera angels, dubbed languages and subtitles
#Sharpness, Gamma, Brightness, Contrast, Hue and Saturation adjustment.

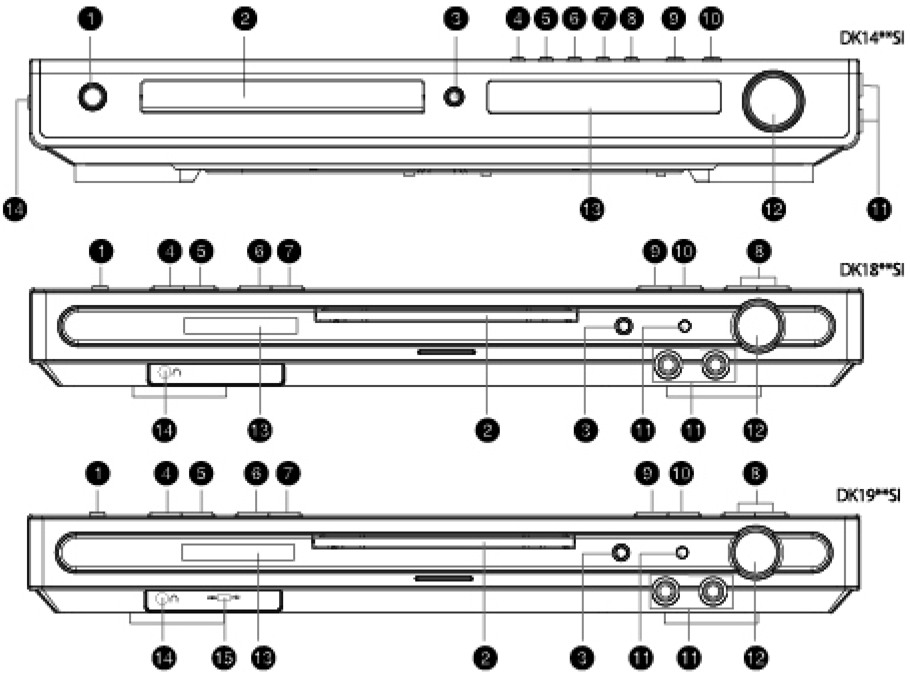
Miscellaneous:

#Support of CD-R/CD-RW, DVD-R/DVD-RW, DVD+R/DVD+RW
#FM/AM tuner with RDS support
#USB port, providing playback of files of supported formats from external flash-memory devices
#KARAOKE+, providing extended karaoke features
#Easy to use on-screen menu in Russian
#Support of Russian file names, Id3 tags and CD-text
#”Memory” function which can load the last disc position on stop

#"Capture" function, auto loading selected bookmarked image as the wallpaper
#Q-Play function that will bring you to the main movie title and skip unskippable commercials
#Virtual control panel function makes your control of the device much easier when playing the movie
#Browser function displays information about playback modes
#Auto protection of TV screen
#Child lock, parental control(protection against playing undesirable discs)

2.2 Controls and functions

2.2.1 Front panel controls



① STANDBY/POWER button
Press to switch the device on/into standby

② Disc tray

③ Open/close button
Press to open/close the disc tray

④ PREV button
Press to playback from the previous bookmark

⑤ NEXT button
Press to playback from the next bookmark

⑥ PEW button
Press to fast reverse/radio station tuning

⑦ Forward button
Press to fast forward/radio station tuning

⑧ SOURCE button
Press to switch between DVD-receiver/Audio input/Tuner/Digital audio input

⑨ PLAY/PAUSE button
Press to playback/pause

⑩ STOP button
Press to stop the playback

⑪ Microphone input

⑫ VOLUME adjuster
Press to adjust volume

⑬ VFD display window

⑭ Headphones input

⑮ USB port

2.2.2 Rear panel connections

① AM Antenna input

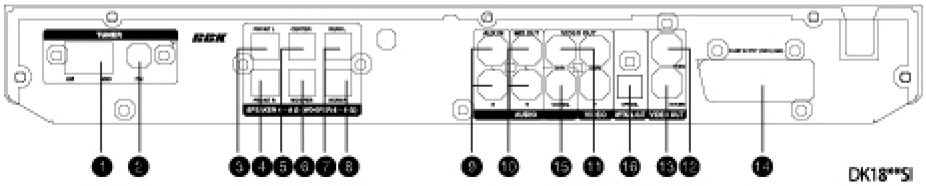
② FM Antenna input

③ Left front speaker input(output from the build-in amplifier)

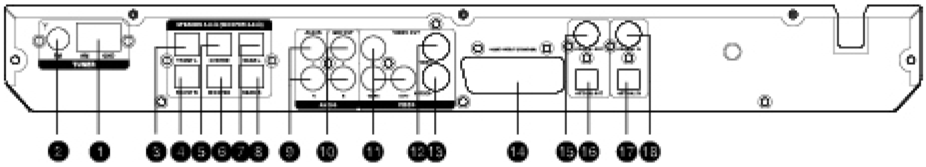
④ Right front speaker input(output from the build-i n amplifier)

⑤ Center speaker input(output from the build-in amplifier

DK14**SI

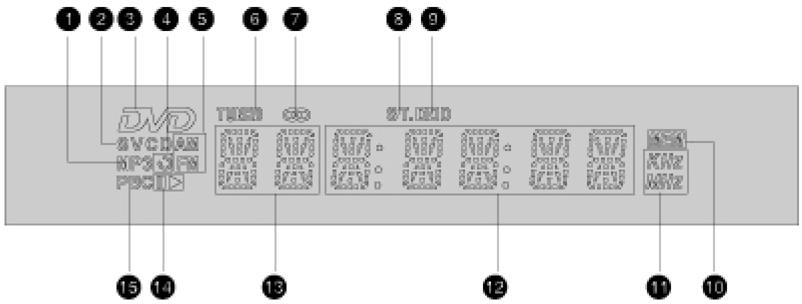


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6. Subwoofer input(output from the build-in amplifier)
7. Left Surround speaker input(output from the build-in amplifier)
8. Right Surround speaker input(output from the build-in amplifier)
9. Audio input
10. Stereophonic audio output
11. Component video output Y Cb(Pb)Cr(Pr)
12. Composite video output
13. S-Video output
14. SCART-type V connector
15. Coaxial digital audio output
16. Optical digital audio output
17. Optical digital audio input
18. Coaxial digital audio input

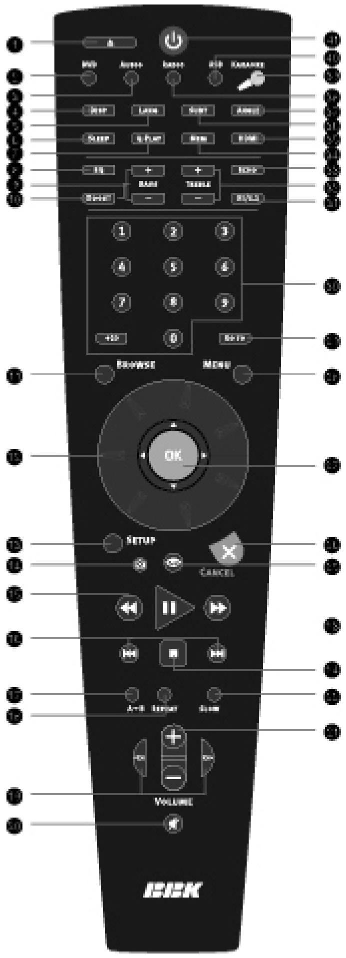
2.2.3 VFD display general view



1. MP3-disc
2. CD-, VCD- or SVCD-disc
3. DVD-disc
4. Repeat
5. AM/FM
6. Radio tuning mode
7. Tuner mode
8. Stereo
9. Dolby Digital
10. Programmed radio station
11. Friquency
12. Playback time
13. Chapters or tracks
14. Playback or pause
15. PBC

2.2.4 Remote control general view

1. EJECT button
   Press to open/close the disc tray
2. DVD button
   Press to switch to DVD mode
3. AUDIO button
   Press to display the disc information
4. DISP button
   Press to display the disc information
5. LANG button
   Press to change the language
6. SLEEP button
   Press to turn the sleep mode on



(7) Q-PLAY button

Press to turn the Q-Play mode on.

(8) EQ button

Press to adjust the equalizer

(9) BASS +/- button

Press to adjust subwoofer

(10) BOOST button

Press to bass boosting

(11) BROWSER button

Press to turn on/off the browser function

(12) JOG DIAL wheel

Functions are set manually. Default function: ZOOM

(13) SETUP button

Press to switch to setup mode

(14) Button

Press to capture and bookmark image for the wallpaper

(15) Buttons

Press to start reverse or forward scanning.

(16) SKIP/PRESET +/-

Press to switch between files on disc/tuned radio stations.

(17) A-B buttons

Press to repeat the selected portion

(18) REPEAT button

Press to repeat playback

(19) CH +/CH - button

Press to change the acoustic channel

(20) MUTE button

Press to turn on/off the sound

(21) VOLUME +/- button

Press to adjust the volume

(22) SLOW button

Press to switch to slow down the playback

(23) PLAY/PAUSE button

Press to Play/pause the playback

(24) STOP button

Press to stop the playback

(25) Button

Press to trun on/off the virtual control panel

(26) CANCEL button

Press to go one level back/cancel current operation

(27) OK button

Press OK for confirmation or use it like joystick during navigating in MENU.

(28) MENU button

DVD-disc menu/PBC function

(29) GOTO button

Press to playback from the target place.

(30) Numeric buttons

(31) ST/5.1 button

Press to switch between STEREO/5.1CH

(32) Treble +/- button

Press to adjust the tone

(33) ECHO button

Press to adjust the echo function of the microphone.

(34) MEM button

Press to memorize the point where playback was stopped/playback from the previously memorized point.

(35) HDMI button

Press to switch to HDMI mode

(36) SUBT button

Press to change the subtitles language

(37) ANGLE button

Press to change the camera angel

(38) RADIO button

Press to switch to radio mode

(39) KARAOKE button

Press to set the karaode functions

(40) USB button

Press to switch to USB mode

(41) Button ⏻

Press to switch the device on/into standby

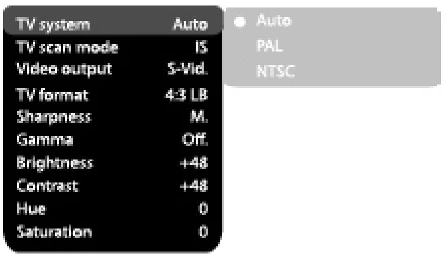
2.3 FUNCTION SETTINGS

2.3.1 Function selection and change

Press the SETUP key to show the setup menu. You will the following image on the screen, as shown on the figure:



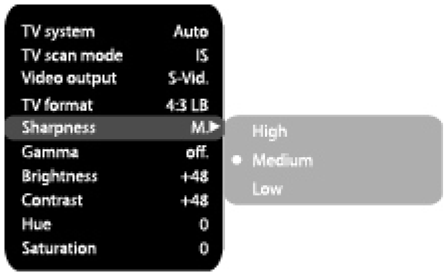
1.For example, if you wish to change the change the image settings, you have to select the image item and press the OK or RIGHT key of the cursor joystick.



2.Using the jog Dial, select the desired item and press OK or RIGHT key of the cursor joystick. For example, select the Sharpness item. Settings will appear on the screen. Then select the desired sharpness level and press OK for confirmation.

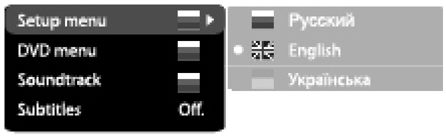
3.Press LEFT key of the cursor joystick for exit to previous menu level.

4.Press SETUP to exit setup menu.



2.3.2 Language settings

1.Menu: interface language setup
#Options: Russian, English, Ukrainian
#Default option: English

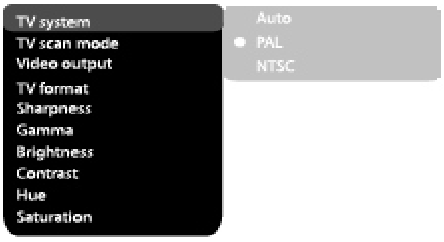


2.DVD-menu: selection of disc menu language
3.Soundtrack: selection of translation language
#Options: Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Belarusian, Ukrainian, Chinese.
#Default: English
#Selection of other languages: select the OTHERS item using the jog Dial and press OK. Enter the language code using the numeric buttons and press OK.
#If the language you selected is not recorded on the DVD disc, another available language will be used.
4.Subtitles: selection of subtitles language
#Options: Off, Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Belarusian, Ukrainian, and Chinese.
#Default option: Off.
#Selection of other languages: select the OTHERS item using the jog Dial and press OK. Enter the language code using numeric buttons and press OK.
#If the language you selected is not recorded on the DVD disc, another available language will be displayed.

2.3.3 Image settings menu

1.TV system: TV system selection
#Options: Auto, PAL, NTSC
#Default option: PAL
2.TV scan mode: scan mode selection
#Options: progressive, interlaced
#Default option; Interlaced
#Progressive scan is transferred only via a component video output.

#Before switching to progressive scan, make sure that your TV set supports this operation mode.



3.TV Format: image ratio settings
#Options: 4:3 pan&scan, 4:3 letterbox and 16:9 TV.
#Default option: 4:3 letterbox.
#Some discs are recorded with support of only one ratio. The selected ratio must comply with the TV screen.
4.Video output: selection of video signal
#Options: S-Video(only for DK14**SI Series), Comp, SCART.
#Default option: Comp
5.Sharpness: image sharpness adjustment
#Options: High, Medium, Low
#Default option: Medium
6.Gamma: adjustment of image color temperature
#Options: High, Medium Low, Off
#Default option: Off
7.Brightness: adjustment of image brightness
8.Contrast: adjustment of image contrast
9.Hues: adjustment of image hues
10.Saturation: adjustment of image saturation
Adjustment of image brightness, contrast, hues and saturation:
#Select the desired item of the image adjustment section using the jog Dial. Press OK or RIGHT key to start adjusting the relevant option
#Change the option value using the jog Dial.
#Upon completion press the LEFT key of the cursor joystick to return to image setup menu.

2.3.4 Sound settings menu

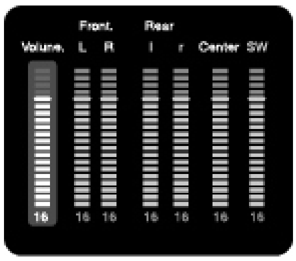
1.Mixer
a)Configuragion: setting of the mode conversion of the 5-channel signal to stereo signal
#Options: Stereo, 5.1
#Default option:5.1
#5.1 mode must be supported by the disc. Number of music accompaniment channels depends on the specific disc.
#Adjustment of th4e central speaker and surround speakers is available only if the Configuration option is set to 5.1 position.



b)Stereo mix: playback set-up while playing the disc with two independent audio channels
#Options: L+R, L, R
#Default options: L+R
c)Surr.mix: set-up of surround options while playing the stereo disc.
#Options: Off, Sum. L+R,Virt.Surr.
#Default options: Off
d)Low band: distribution of low frequencies through channels
#Options: Front F, Center C, Surround Sr, Subwoofer SW
#Default options: Front F, Subwoofer SW.
#If you want the low-frequency component of the sound signal enter only the subwoofer channel, select and confirm the parameter Subwoofer SW.



e)Channel settings: separate adjusting of volume by channels.(only for DK14**SI Series)
#Select the channel you want.
#Adjust the sound volume of each channel using the wheel.
#Press the OK to return to sound settings menu.



f)Delay of the channel: set-up of signal delay in speaker channels(central, rear and subwoofer)
#Using the jog Dial, select the channel for which you want to set up the delay, and press OK for confirmation.
#Using the jog Dial set up the desired distance from the listener to each speaker(detailed description of this operation see on page 32).

#Press LEFT key of the cursor joystick to return to speaker configuration menu.



g)PRO Logic II: function of stereo sound conversion to 5-channel sound
#Options: On, Off, Auto
#Default option: Off
#In Auto position, the DVD receiver determines itself, when to use the PRO Logic II decoder. Some discs do not support this function.
2.Digital audio output
a)SPDIF format: set-up of digital audio output options
#Options; RAW, PCM
#Default options; RAW
When you select the RAW option, the not decoded signal is transferred to the DVD receiver's digital outputs, the decoded signal is transferred to analog outputs. Decoding is performed by the built-in decoder of the DVD receiver. This feature is meant to ensure that signal decoding at digital outputs is performed by an external device(e.g.an amplifier).
#If you select the PCM option, a PCM coded signal will be transferred to the DVD receiver's digital outputs.
b)LPCM: set-up of digital audio output options to comply with different amplifiers an d receivers
#Options: 48kHz 16 bit, 96 kHz 24 bit .
#Default option: 48kHz 16 bit.
3.Sound correction
a)Max volume: max volume limiting(only for DK14**SI Series)
#Using the jog Dial, adjust the max volume level.
#Press the LEFT key of the cursor joystick to sound correction setup menu.
b)Equalizer: equalizer modes
#Options: Rock, Pop, Live, Dance, Techno, Classic, Soft.
#Default option: Off.
c)Echo; echo effects
#Options: Off, Concert, Living room, Hall Bathroom Cave, Arena, Church
#Default option: Off
d)Tone balance: adjustment of tone balance level.
#Adjust the tone balance level using the jog Dial
#Press the LEFT key of the cursor joystick to return to sound correction setup menu.

2.3.5 Playback settings

1.DVD

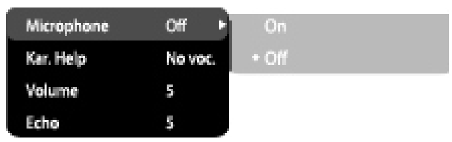
Advertisment skip: skip the unskippable block while playing a DVD disc.
#Options; Yes, No
#Default option: Number
#Press LEFT key of the cursor joystick to return to speaker configuration menu.



2.VCD/SVCD
PBS menu: PBC menu on/off
#Options: On, Off
#Default option: On
#If On option is set, while erproducing discs, a menu will appear, in which you can select the order of playing the disc content. If the Off option is set, the reproducing of content is performed in the order, in which it is recorded on the disc.
3.Files: selection of reproduced files on the disc
#Options: Audio, Pictures, Video All types.
#Default option: All types
4.Repeat: file repeat mode
#Options: Off, Single, All
#Default option: Off
5.Load effect: type of transition from one JPEG file to another
#Options: Off, from top, from bottom
#Default option: Off.

2.3.6 Karaoke settings menu

1.Microphone: microphone on/off
#Options: On, Off
#Default option: Off



2.Kar.help: karaoke-disc playback mode
#Options: L Channel, R Channel, No ast, No voc
#Default option: No vocal mode
3.Volume:

Microphone: microphone sound volume level
#Using the jog Dial adjust the microphone volume level.

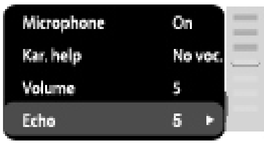
#Press LEFT key of the cursor joystick to return to karaoke settings menu.



4.Echo: echo level while playing the karaoke-disc

#Adjust the echo level Using the jog Dial

#Press LEFT key of the cursor joystick to return to karaoke settings menu.



2.3.7 Preference settings

1.Backlight: Selection of open/colse button LED

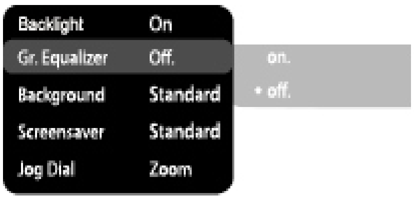
#Options: On, Off.

#Default option: On

2.Gr.Equalizer: spectrum analyzer

#Options: On, Off

#Default option: Off



3.Background: selection of an image as TV screen wallpaper

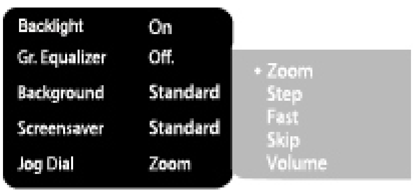
#Options: Standard, Saved

#Default option: Standard

4.Screensaver: screen saver on/off

#Options; On, Off

#Default option: On



5.Jog Dial

#Options: Zoom, Step, Fast, Skip, Volume

#Default: Zoom

2.3.8 Parental Control

1.Category: setup of age restrictions to prevent children from seeing undesirable discs

#Options: Any, Kid, G, PG, PG-13, PGR, R, CN-17

#Default option: Any



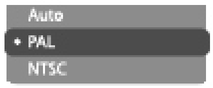
2.Set password: setup of a four-digit password to change the level of age restrictions

#Default option: 7890



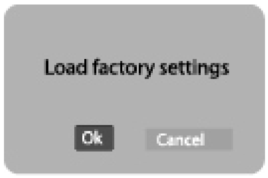
2.3.9 Initial setup menu

#Press the RIGHT key of the cursor joystick to enter the initial setup menu, then select the desired item using the jog Dial and press OK key for confirmation.



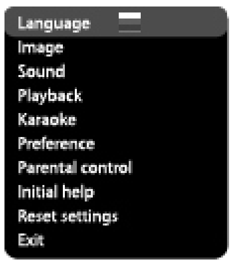
2.3.10 reset to defaults

Resetting all settings and restoring default options, except age restrictions level and password



2.3.11 Exit settings menu

#Select the exit item using the jog Dial and press the OK to exit the menu.



2.3.12 Channel delay set-up

Set-up of time delay in the surround channel

Usually, time delay in the Dolby digital decoding system is preset to ensure best effect while installing the Home Theater. However, in case you wish to adjust your system more precisely, please consult instructions given in this manual.

Set up of tie delay for this device is possible in both Dolby Digital and Dolby Pro Logic modes..

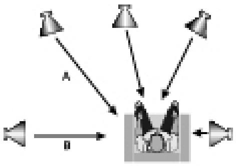


Fig. 1. Take into account the A-B distance; use both figures for setting the desired time delay.

To set the desired delay you have to know the distance from the place where you are, to the front speakers and Surround speakers as shown in Fig.1. Consult Fig.2(Dolby Pro Logic mode) and 3(Dolby Digital mode)in order to determine the distance to Surround speakers(axis Y in the figure)and the distance to the front speakers (axis X in the figure). Crossing point of those two lines on the chart will give the recommended delay value.

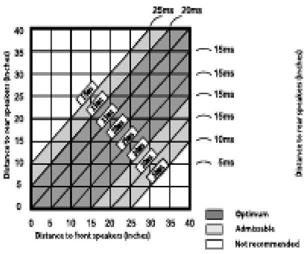


Fig. 2. Determine delay value as to Dolby Pro Logic mode.

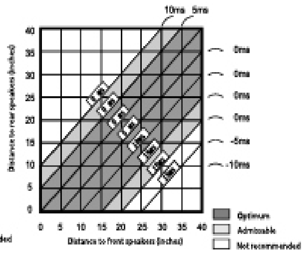


Fig. 3. Determine delay value as to Dolby Digital mode.

Set-up of time delay in the central channel

Sometimes several people are listening to the music, and the space is limited. In this case, you can install three speakers(two front ones and a central one)as shown in Fig.1 with the distance to the listener being approximately the same. The central channel delay is to be set at "0".

Should the central speaker be in close proximity to left and right front speakers as shown in Fig.2, or the central speaker be nearer to listeners when compared with front speakers' location, or the central speaker be nearer to the listener by 1 foot, in all these cases you may set the delay value for the central channel at 1 ms.

For instance, as shown in Fig.2, if the line C is by 1 foot shorter than the lines R and L, the delay value is to be set at 1 ms. If your sofa is broad enough, and there are several listeners sittings on it.

It makes sense to locate the speakers in one line, as shown in Fig.3 with the delay value of the central channel to be set at "0". Finally, if it will be necessary to install the central speaker behind the left and right front speakers, the delay value shall be set at "0".

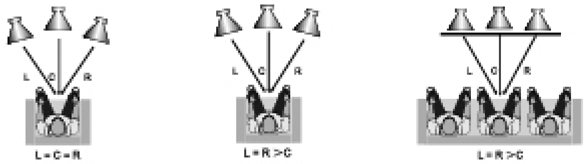


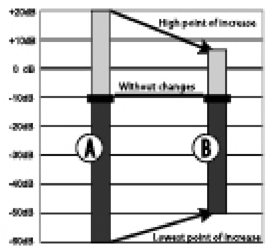
Fig. 1. Delay of central channel = 0 L=R=C

Fig. 2. Small area Delay of central channel = L=(or R) - C

Fig. 3 Small area Delay of central channel = 0 L=R>C

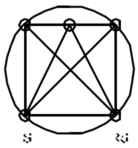
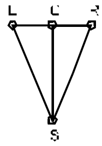
"Night" mode

The Dolby Digital system provides an extremely broad dynamic range of playback sound-from gentle to roaring. It creates the presence effect, especially while seeing motion pictures. However, at night a powerful sound with a broad dynamic range may give pleasure to you, but disturb and annoy your family and neighbors. If you just decrease the volume, you will immediately notice that you ceased to hear, e.g., Dialogues as clear as you do at normal volume, and such sound effects as rustle, whisper etc have merely disappeared. To avoid this, you just have to decrease the volume of "loud"sounds by simultaneously increasing the volume of "soft"sounds with the volume of "average"sounds left unchanged, i.e.just decrease the dynamic range of sound accompaniment. Only Dolby Digital system provides for such a method of sound control. It uses the principle of compressing the acoustic signal's dynamic range while recording; therefore, while playing an inverse transformation(volume expansion)takes place. This is called"night"mode. The regulation limits are restricted, however, to avoid distortions of resultant signal.



Principle of compressing the acoustic signal's dynamic range.

	Dolby Digital	Dolby Pro Logic surround
Rear channel	Stereo 20 Hz-20khz	Mono channel with limited friquency range(100 Hz-7khz)

Low-frequency channel(subwoofer)	Available, 20-120Hz	N/a
Sound field distribution	multivariate 	From left to right, from right to left, from front to rear, from rear to front 
Sound field distribution	6 Independent channels, each reproducing its own signal at a time	4 segmented channels. Only one channel is decoded at a time.
Miscellaneous	Creates an optimum sound field with illusion of an equal distance from listener to each speaker.	The most cost-efficient way to ensure high-quality surround effect.
	Allows adjusting the decompression degree of an equal distance from listener to ecach speaker.	Surround sound may be received from any signal source.
	Possilility of programmable control of the decoder to transfer basses into low-frequency channel in systems equipped with broad-band speakers and a subwoofer.	Compatible with existing and future two-channel(stereo)formats.
	Undoubted progress in sound recording technology, especially important for program directors, film directors, sound engineers and actors.	Big progress in comparison with conventional stereo, the world's most popular surround format.

2.4 Technical characteristics

DVD receiver	Playback discs	DVD-Video, Super VCD, VCD, DivX 4, DivX 5, DivX Pro, XviD, CD-DA , CD+G, HDCD, MP3, WMA, Kodak Picture CD, JPEG	
	Input	2 MIC jacks FM antenna input AM antenna input Stereo audio input(AUX)	
DVD receiver	Output	Audio output	Analog audio output: Stereo Digital audio output: Coaxial, Optical
	Video characteristics	Video amplitude: 1.0Vp-p(75Ω) S-Video amplitde: Y:0.7vP-P(75Ω) Component video amplitude: C:0.286vP-P(75Ω) 1.0vP-P(75Ω)	
	Audio characteristics	Frequency response 20-20000Hz(±1 Db) Signal-to-noise ratio >90(dB) THD <1%	
	Operating voltage Power consumption	~220V,50/60 Hz 250W	
FM Tuner	Frequency range Channel separation	87.5-108 MHz >35dB	
AM Tuner	Frequency range	522-1611kHz	

Speaker system	Output power RMS, 10% THD, 1 kHz	DK1110SI	DK1112SI	DK1114SI
	Subwoofer (40Hz)	25	25	25
	Front channel	12	12	12
	Rear channel	12		
	Center channel			
	Maximum power			
	Subwoofer	40	50	50
	Front channel	20	20	20
	Rear channel	20	20	20
	Center channel			
Operating temperature	5-35℃			
Operating humidity	15-75%(no condensation)			
Dimensions of DVD-receiver	60×380×350mm			
Weight of DVD-receiver	3.4kg			
Dimensions of speakers		DK1110SI	DK1112SI	DK1114SI
	Subwoofer	325×310×200	325×310×200	325×310×200
	Front channel	80×101×165	80×101×165	150×90×86
	Rear channel	80×101×165	80×101×165	150×90×86
	Center channel	80×		

ChapterThreePrincipleandServicing

SectionOnePrincipleofthePlayer

3.1.1 Function and features

Progressive scanning output to produce steadier and clearer pictures without flickering.

Composite video, S-video, component video output.

Digital picture adjustment to the sharpness, brightness, contrast, chroma and saturation of pictures, gamma correction.

Built-in Dolby digital decoder. Karaoke function.

Hi-Fi stereo headphone output. 5.1CH output.

Power amplifier adopts high performance large power IC with complete protection function and perfect sound quality.

Compatible with DIVX, MPEG4 format disc.

Subwoofer adopts large diameter bass unit matched with large capacity speaker body.

3.1.2 Block diagram of the player

Its internal structure is mainly composed of decode & servo board, power amplifier board, input/otuput board, panel, headphone board, tuner, power board and loader. The principle block diagram is shown as the figure 3.1.2.1. All other signal flow is shown in figure except power board. The function of loader is to read disc information and transmit it to Mt1389, which performs servo function through D5954 on decode board and other supplementary circuit, and ensues the normal working of loader. FLASH on decode board is to store system program, SDRAM is to store program and sound/image information read from disc when the player is working to ensure their smooth output. The main function of power amplifier board is to perform audio D/A conversion, amplify analog signal and output 5.1CH to ensure the normal working of external speakers. The main function of AV board is to output various audio signals. This player is also with headphone and microphone to meet customers' demand. Further more, it also has external sound input, which may amplify power by use of power amplifier board of this player to output to speaker. Tuner in this player makes it have tuning function. It is also equipped with SAA6558 chip to realize RDS function of Europe and RBDS function of US.

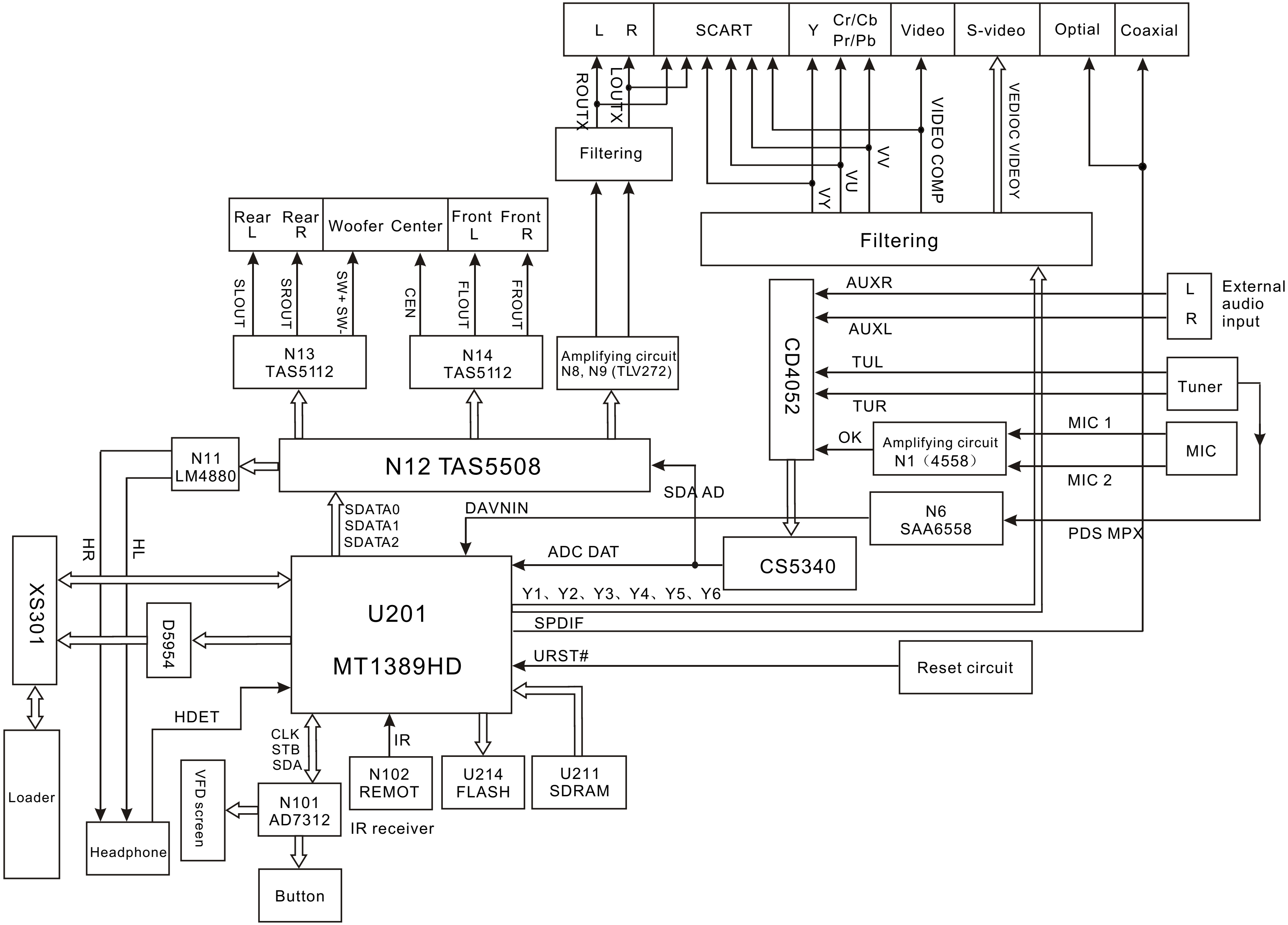


Figure 3.1.2.1 Block diagram of the player

3.1.3 Introduction to IC used in this player

Introduction to IC used in DK1910SI is shown in the following table:

PCB semi-finished product name	IC model	Location	Function
decode board	MT1389HD	U201	Decode chip
	24C02	U202	EEPROM
	RT9701	U203	
	HCU04	U205	Phase inverter
	LM1117	U209	Precision voltage stabilizer
	HY57V641620HGT-7	U211	64M SDRAM
	29LV160BE	U214	16M FLASH
	D5954	U302	Servo drive
Power amplifier board	4558	N1	Audio amplifying
	SN74LVC	N2	Phase inverter
	74HCT125	N3,N4	Buffer
	CD4052	N5	Audio mixing
	SAA6588	N6	Tuning IC
	CS5340	N7	A/D conversion
	TLV272	N8,N9	Operational amplifier
	LM4880	N11	Audio amplifying
	TAS5508PAG	N12	Pulse width adjuster
	TAS5112DFD	N13,N14	Digital power amplifier
	PT2597	N15	
Main panel	AD7312	N101	Panel control IC
	REMOT	N102	Remote control receiver
Power board	VIPER22	U501	Power switch IC
	HS817	U502,U506	Photoelectric coupler
	TL431	U503,U507	Precision voltage stabilizer
	LM7805	U504	Voltage stabilizing tube
	KA1M0880BTU	U505	Power switch IC

Section Two Unit Circuit Principle

3.2.1 Introduction to laser head

1. Function introduction to laser head flat cable is shown as the following table:

Pin	Name	Signal flow direction	DVD disc	CD disc	No disc	Function description
1	F-	Input loader	2.52	2.34	0.46	Focus error signal is added to two sides of pick-up focus coil
2	F+	Input loader	2.49	2.49	0.93	
3	T+	Input loader	2.53	2.51	0.94	Trace error signal is added to two sides of pick-up trace coil
4	T-	Input loader	2.58	2.51	0.93	
5	C	Input MT1389	2.2	2.25	2.04	Disc data signal
6	D	Input MT1389	2.2	3.2	2.04	Disc data signal
7	IOA	Input MT1389	0.01	3.2	3.21	Disc identification signal, CD is 3.3V, DVD is 0V
8	RF	Input MT1389	2.21	2.53	1.28	The sum of disc data signal
9	A	Input MT1389	2.17	2.22	2.04	Disc data signal
10	B	Input MT1389	2.19	2.27	2.04	Disc data signal
11	F	Input MT1389	2.07	2.44	2.03	Supplementary signal used in trace
12	GND	Ground	0.01	0.01	0	Grounding
13	V20	Input loader	2.04	2.06	2.03	Reference voltage
14	Vcc	Input loader	5.04	5.04	5.02	Supply voltage for loader
15	E	Input MT1389	2.06	2.45	2.03	Disc data signal
16	Blanking	haning in air	0.01	0	0	unused

17	VR-CD	Input loader	0.21	0.01	0	Through the handling inside loader, make sure MD11 is 180mV when reading CD
18	VR-DVD	Input loader	0.01	0.2	0	Through the handling inside loader, make sure MD11 is 180mV when reading DVD
19	LD-CD	Input loader	0.09	2.1	0	CD laser power control signal
20	MDII	Input MT1389	0.21	0.2	0	CD and DVD laser power monitoring signal
21	HFM	Input loader	5.04	5.04	5.02	High frequencyoverlapping signal produces laser with different wave length inside loader
22	Blanking	unused	0.01	0.1	0	
23	LD-DVD	Input loader	2.21	0.1	0	DVD laser power control signal
24	GND	unused	0.01	0.01	0	Grounding

Note: 1. When reading DVD, there are only A, B, C, D signals.

2. When reading CD, there are A, B, C, D, E, F signals.

3. RFO=A+B+C+D.

4. Focus error signal=(A+C)-(B+D) Trace error signal=E-F.

2. Working principle

(1) Laser tube: wave length of loader DVD laser diode is 650nm, wave length of CD laser diode is 790nm, the wave length which is within 370nm and 750nm is visible light, the laser in the course of reading DVD disc is visible light, and that when reading CD disc is infrared light.

(2) Principle about laser head picks up signal: laser beam projects onto disc, when laser beam focus projects onto disc vertically, laser beam will produce reflection, reach on light sensor through reflection loop and converse into electronic signal through photoelectric cell. For the reflection loop produced in non pit information area and pit information area in disc has difference and reflects into different position of light sensor, photoelectric diode in different positions on light sensor will produce different signals to process all signals on light sensor and then produce digital signals.

(3) Focus, trace coil: when laser head is reading signals normally, information side should be in the focus of laser beam, because of factors of disc error, high speed rotation and machine error, it is unavoidable that laser beam focus deviates from information face to produce phenomena of orbit boas and refocusing. Focus , trace coil is added on loader to adjust laser beam to make it correctly focus in information area.

(4) Formation of RF signal: when disc reading is normal, light sensor will have 160MV, vague and eye pattern waveform which is added on A, B, C, D respectively, and output RF signal from FRO pin after being overlapped by adder inside light sensor, the frequency when reading DVD disc is much higher than that when reading CD disc, output amplitude is about 1.4V.

3.2.2 Servo circuit

1. DK1910S adopts SANYO 62 decoder and MTK decode solution (MT1389+FLASH (16M)+SDRAM (64M)). The servo circuit is mainly composed of front signal processing, digital servo processing, signal processing IC T1389 and drive circuit D5954, in which MT1389 is the main component of decode circuit at the same time, shown as the figure 3.2.3.1:

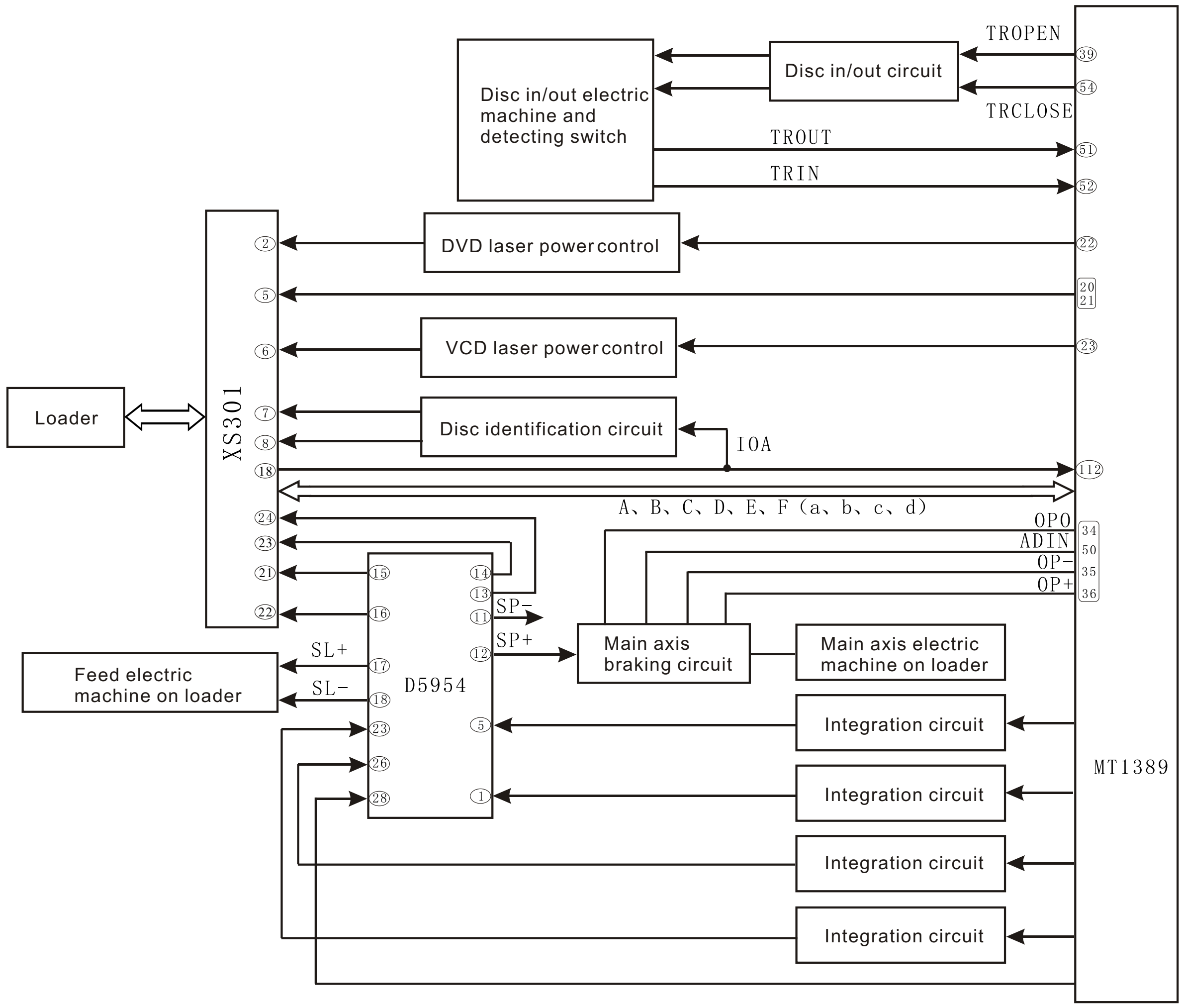


Figure 3.2.2.1 Servo circuit diagram

2. Working principle: after powering on or disc in, according to IOA signal, disc identification circuit decides through which path of variable resistor the laser detecting diode gets path to the ground, meanwhile MT1389 decides whether DVD laser or VCD laser is emitted according to IOA signal, which can be fulfilled through laser power control circuit. When IOA is high level (3.3V), Mt1389 pulls LOD1 of V302 base electrode in laser tube power control connected to VCD down to about 2.2V to make V302 on and to make VCD laser tube emit beam; then decides whether to pull up or pull down LOD1 according to voltage after the feedback from MDI1 to control the power of light emission diode. Similarly, when IOA is low level (0V), MT1389 pulls LOD2 of V301 base electrode in laser tube power control connected to

DVD down to about 2.2V to make V301 on and to make DVD laser tube emit beam; then decides whether to pull up or down LOD2 according to the voltage after the feedback from MDIAfter loader reading disc information, A, B, C, D, E, F signals are sent out to Mt1389 (DVD only has A, B, C, D signals), and then inputted from pin 2~11, 18, 19 of MT1389. After being amplified and processed by the pre-amplifier inside MT1389, now signals are separated to two part s for processing inside Mt1389.

After being processed by digital servo signal circuit inside MT1389, one part of signal form corresponding servo control signals and output FOO, TRO, DMO, FMO digital servo control signals from pin 42, pin 41, pin 37, pin 38 of Mt1389 respectively, then change into analog servo control signal FOSO, TRSO, DMSO, FMSO through integration circuit composed by resistor capacitor, and send to driver circuit BA5954 for amplification to bring along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplification. Among these, focus and trace servo are used to correct objective position accurately; feed servo is used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to pick-up position;and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate.

After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside MT1389, another part of signals are changed into digital signals through internal A/D converter. When loader is reading CD/VCD signals, these signals are conducted EFM demodulation inside MT1389, and then outputted to latter stage for AV decoding after finishing CIRC (Cross-Interleaved Reed-Solomon Code) error correction inside. When loader is readingDVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside.

The other part of servo is open/close disc tray circuit. After panel or remote controller emits open/close disc tray signal toMT1389, in usual conditions, TROPEN and TRCLOSE sent out by pin 39, 51 of Mt1389 are both low level, when signal of “open” comes, after Mt1389 makes disc stop rotating through main axis braking circuit, TRCLOSE is set high to make open/close electric machine on loader frame run to bring along dist tray to eject. After disc tray ejecting to proper Signal of opening to proper position (TR_OUT) is set high level (0V) through the detecting switch on loader frame, MT1389 pulls down TRCLOSE and open/close electric machine stop running. When MT1389 receiving “close” signal, TROPEN is set high level by MT1389, open/clode electric machine tuns conversely to bring along disc tray to close. After disc tray closing to proper position, signal of closing to proper position (TR_IN) is set low level through the detecting switch on loader frame, MT1389 pulls down TROPEN and electric machine stops running to finish “close” process.

3. Explanation to servo terms

FOO: when rotating, disc may probably move upwards or downwards slightly to make the focus of laser emitted by pick-up cannot justly fall on data pit of disc, so pick-up is required to move upwards or

Downwards to make focus aim at data pit justly. When pick-up is moving upwards or downwards, it means that pick-up is making focus acts.

TRO: data information is save in disc in form of tracks. The process when pick-up moves from one track to another one to read data is trace. In this process, it is objective, but the entire pick-up, that moves forwards or backwards, and the moving range is very small.

FMO: similar to acts of trace, the acts of feed are larger than those of trace. Feed conducts a large scale movement firstly, and then trace moves slightly in this range. Feed moves for a while, and does not move for another while; but Trace moves all the time. Feed is rough adjustment and trace is fine.

DMO: it is the top that holds up disc. Its rotation speed decides that of disc. Its rotation is generated by an individual DC electric machine, in which rotation speed of DVD is twice over that of CD. Hint: In order to observe these processes, you may take down upper cover of the machine, and then the loader cover board. When power on with no disc in or disc in after disc out, you may observe that pick-up returns to inner ring firstly and then springs back for a little distance, which is feed process. Then pick-up will emit light and you may notice the objective moves upwards and downwards, which is focus process. In face, in the same time of focus, the objective also moves upwards and backwards to make trace acts. Because the range is small, it is not easy to observe, and meanwhile DEMO disc tray also rotates slightly, which is DEMO acts.

4. Voltage of key point is shown as follows:

Name	When reading disc normaly	When disc out	When disc in	When no disc in
TROPEN	0	There is about 1 second 3.3V pulse when at the moment of disc out	0	0
TRCLOSE	0	0V	There is about 1 second 3.3V pulse when at the moment of disc out	0
TROUT	3.41V	3.3V→0V	0V→3.3V	3.3V
TRIN	0	0V→3.3V	3.3V→0V	0
OPO	2.61V	2.75V	2.64V	2.61V
ADIN	2.61V	2.76V	2.61V	2.61V
OP+	1.66V	1.81V	1.27V	1.81V
OP-	1.85V	2.12V	1.47V	2.04V

3.2.3 Main axis braking control circuit

1. Main axis braking control circuit is shown as the following figure 3.2.3.1:

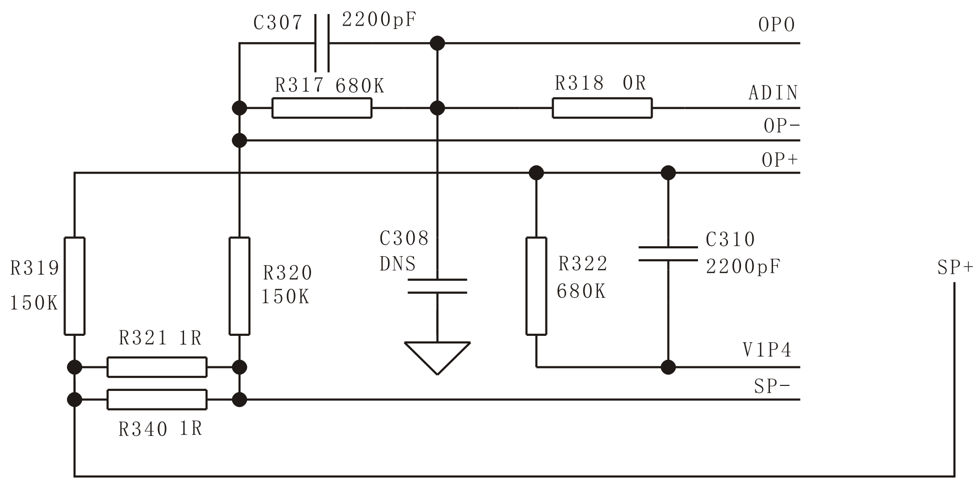


Figure 3.2.3.1 Main axis braking control circuit diagram

The equivalent circuit is shown as the following figure 3.2.3.2:

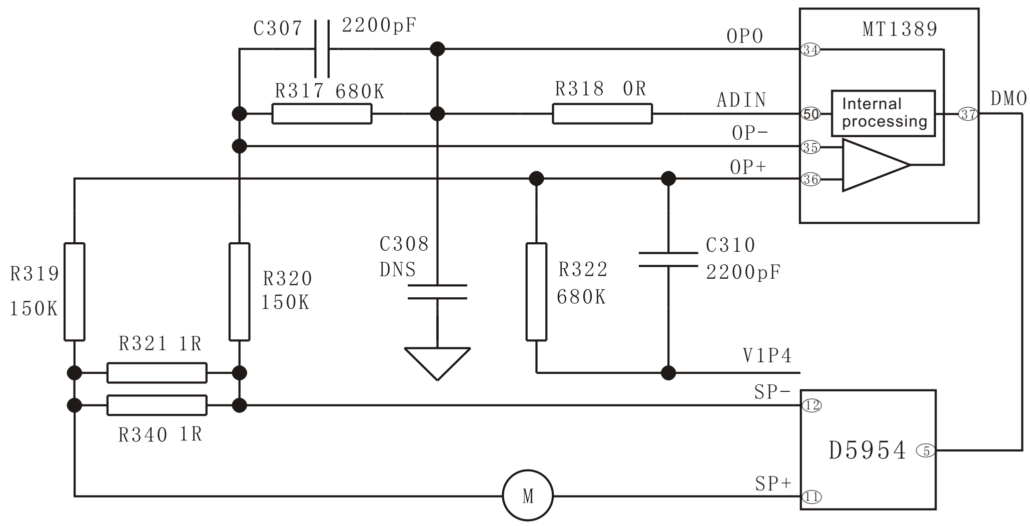


Figure 3.2.3.2 Main axis braking control equivalent circuit diagram

2. Working principle: To prolong the service life of electric machine and decrease the influence of start-up concussion current to the machine, when there is disc in, the development personnel design the main axis electric machine in running state always. Even though “STOP” button is pressed, disc will not stop running immediately. Thus when pressing “OPEN” button, a braking signal is required to make the main axis electric machine stop running to fulfill the completion of opening disc tray in a short period.

In the course of playback, press “OPEN" button and main axis drive signal disappears. For the reason of inertia, the main axis electric machine is still in running state, and now the induced voltage achieved by the induced electromotive force which is generated by electric machine's running on sampling resistor R321 and R340 outputs from pin 34 through resistor R319, R320 and pin 35, 36 of MT1389 after being processed inside MT1389 and magnified, then sends to pin 50 of MT1389 through R13; after A/D conversion and the corresponding processing inside MT1389, an instant electric machine reversal braking signal is outputted from pin 37 of MT1389 to make the main axis electric machine decrease speed. When MT1389 detects the disc stops running, disc tray will open to ensure that disc will not run when disc tray opens.

3. Key point voltage (unit: V), shown as the following table:

Key point	Position	Normal working voltage (V)	Voltage change when disc out (V)
SP+	Pin 11 of D5954, pin 5 of XS303	3.79	3.79→0.70→1.80
SP-	Pin 12 of D5954, pin 6 of XS303	1.38	1.38→3.40→1.80
OP+	Pin 36 of MT1389/B	1.38	1.38→3.10→1.80
OP-	Pin 35 of MT1389/A	1.53	1.53→3.08→1.98
OPO	Pin 34 of MT1389/C	2.44	2.44→0.40→2.50
ADIN	Pin 47 of MT1389/D	2.44	2.41→0.41→2.44
DMSO	Pin 5 of D5954	1.42	1.42
VIP4	Pin 30 of MT1389	1.41	1.41

3.2.4 Disc identification circuit

1. Disc identification circuit is shown as the following figure 3.2.4.1:

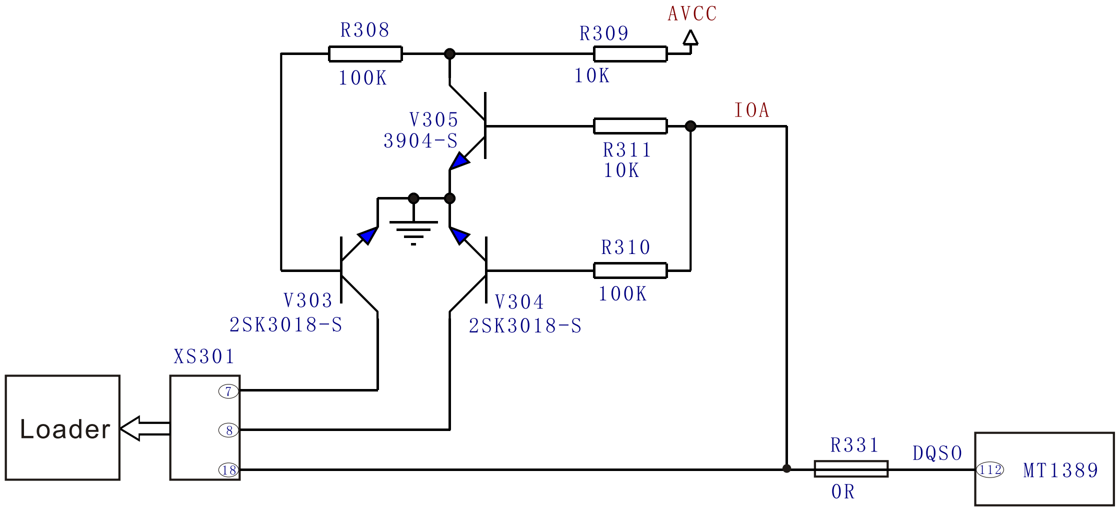


Figure 3.2.4.1 Disc identification circuit diagram

2. Working principle: the function of disc identification circuit is to identify the disc inserted to loader and judge whether the disc is VCD or DVD to perform the corresponding control acts. When disc is inserted in, decode servo control IC MT1389 defaults disc to DVD. Pin 112 of MT1389 outputs a low voltage signal, V305 and V304 are cut off, V303 is on, laser receiver tube inside loader selects DVD channel, now IOA is low level input loader to make loader in the state of reading DVD, through detecting laser power feedback signal, MT1389 analyses whether the preliminary judgment is correct (disc is defaulted DVD). When detecting correct preliminary judgment, loader runs in the state of reading DVD; when detecting incorrect preliminary judgment, MT1389 outputs a high voltage signal from its pin 112, V305 and V304 are on, V303 is cut off, laser receiver tube inside loader selects VCD channel, now IOA is high level input loader to make loader in the state of reading VCD. Whether the preliminarily defaulted disc is VCD or DVD is set by MT1389 internal software.

Note: V303 and V304 are MOS tube.

3.2.5 Disc in/out circuit

1. Disc in/out circuit is shown as the following figure 3.2.5.1:

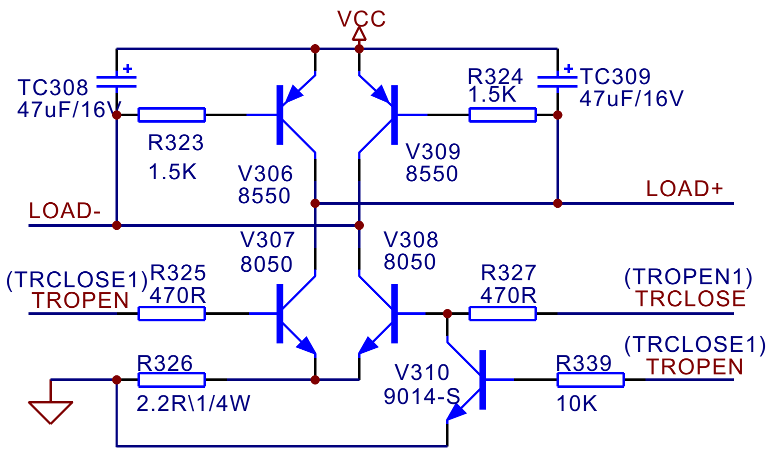


Figure 3.2.5.1 Disc in/out circuit diagram

2. Electric current when disc in/out

Open disc tray: VCC→ V306CE electrode on→ LOAD+→ Electric machine→ LOAD- → V308CE electrode on→R326→Ground

When not opening disc tray, pin 54 and 39 of MT1389 are low level. When opening disc tray, pin 54 of MT1389 sends a high level; V308 is on; V308 collector electrode changes into low level; LOAD- changes into low level; V306 base electrode changes into low level; V306 is on. V306 collector electrode changes into high level and LOAD+ changes into high level.

Close disc tray: VCC→ V309CE electrode on→ LOAD- → Electric machine→ LOAD+ → V307CE electrode on→R326→Ground

When closing disc tray, pin 39 of MT1389 sends a high level; V307 is on; collector electrode changes into low level; LOAD+ is low level; base electrode through R324 and V309 is low level; V309 is on; V309 collector electrode changes into high level; LOAD- changes into high level.

The function of V310 is interlock TRCLOSE and TROPEN signal to ensure the two are not high level at the same time. When the two are high level input, base electrode of V308 is made to low level through V310 on to ensure the normal working of disc in/out circuit. The function of electrolytic capacitor TC309 and Tc308 is to avoid the sudden change of the voltage on two ends of disc in/out electric machine to make disc in/out acts smooth.

3.2.6 Reset circuit

1. Reset circuit is shown as the following figure 3.2.6.1:

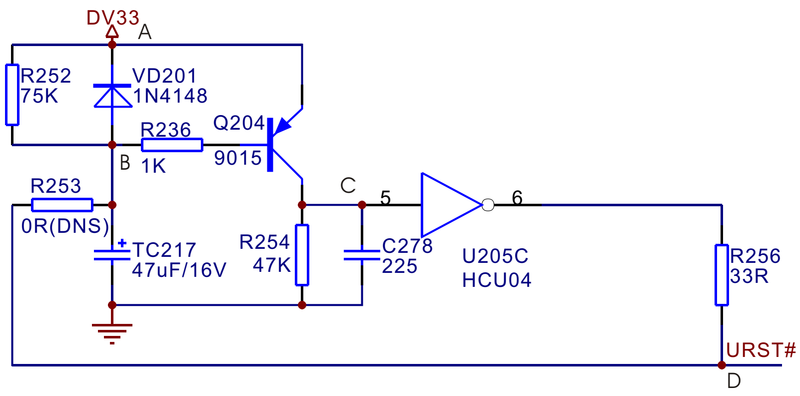


Figure 3.2.6.1 Reset circuit diagram

2. Working principle: The two ends voltage of capacitor T217 cannot change suddenly, anode of the capacitor begins charging from 0V and now triode Q204 is on. Pin 5 of phase inverterU205 (HCU04) output port is high voltage and pin 6 of it is low voltage to reset chip MT1389 FLASH, TAS5508 and Cs5340. When charge of the capacitor is close to 3.3V, triode Q204 cut off; pin 5 of phase inverter input port is low level; phase inverter outputs high voltage from pin 6 and MT1389 reset finishes. After reset of MT1389, reset signal is also given to sound D/A conversion chip CS4360 and sound A/D conversion chip CS5340V for their resetting. In the course of system working, pin 214 of MT1389 outputs reset signal to reset TAS5508 and CS5340 on power amplifier board.

3. Key point voltage is shown as the following table:

Key point	Position	Voltage	Remark
DV33 (point A)	Diode VD201 cathode	3.3V	TC217 may sends out current from this point after power failure

Point B	Diode VD201 anode	3.3V after reset finishes	After reset finishes, voltage increases from 0V to 3.3V
Point C	Pin 5 of reverter	0V after reset finishes	After reset finishes, voltage decreases from 3.3V to 0V
URST# (point D)	Connection place of R256 and R253	3.3V after reset finishes	After reset finishes, voltage increases from 0V to 3.3V

3.2.7 Mute circuit

As shown in the figure 3.2.7.1, this model dose not set special mute circuit and SCMUTE signal outputted from pin 176 o f Mt1389 changes into MUTE signal through flat cable X207 to control As5508. In normal times, it is kept in high level, but after pressing MUTE button, MUTE signal changes to low level to control TAS5508 and make it not output sound.

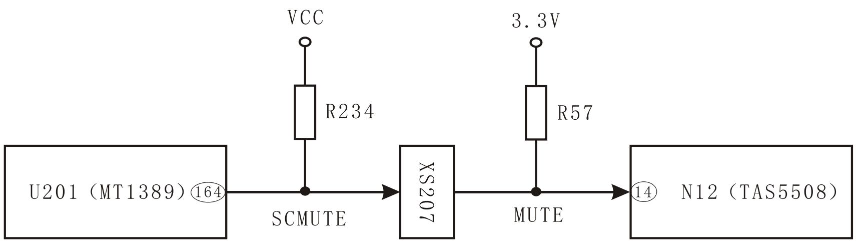


Figure 3.2.7.1 MT1389 SCMUTE signal block diagram

The other factor that causes mute in this model is that after inserting headphone, power amplifier board has no output. As shown in figure 3.2.7.2, this player has two HDET signals, in which one is outputted from headphone terminal and sent to Mt1389, and the other is sent to TAS5508 after Mt1389 receives HDET signal outputted from headphone. When headphone is not inserted, HDET signal outputted from headphone keeps in high level, after headphone being inserted, it changes into 0V and transmits to pin 184 of U201 (MT1389). Pin 174 of MT1389 also outputs RDSID signal, and signal name changes into HDET through flat cable XS201. In normal times, it is also high level, after U201 (MT1389) receives HDET outputted from headphone, it changes into low level, and HDET signal outputted from headphone also changes from high level into low level to inform N12 (TAS5508) of mute. MUTE, HDET signal change is shown as the following figure:

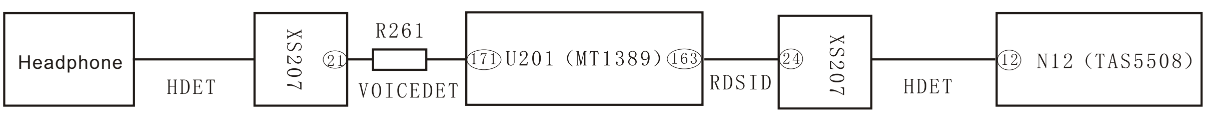


Figure 3.2.7.2 Headphone mute block diagram

Note: when inserting headphone, only mixed left/right channel on AV board have output, and audio signal on power amplifier board has no output; when in mute state, all have no output.

3.2.8 Video circuit

1. Video circuit block diagram is shown as the following figure 3.2.8.1:

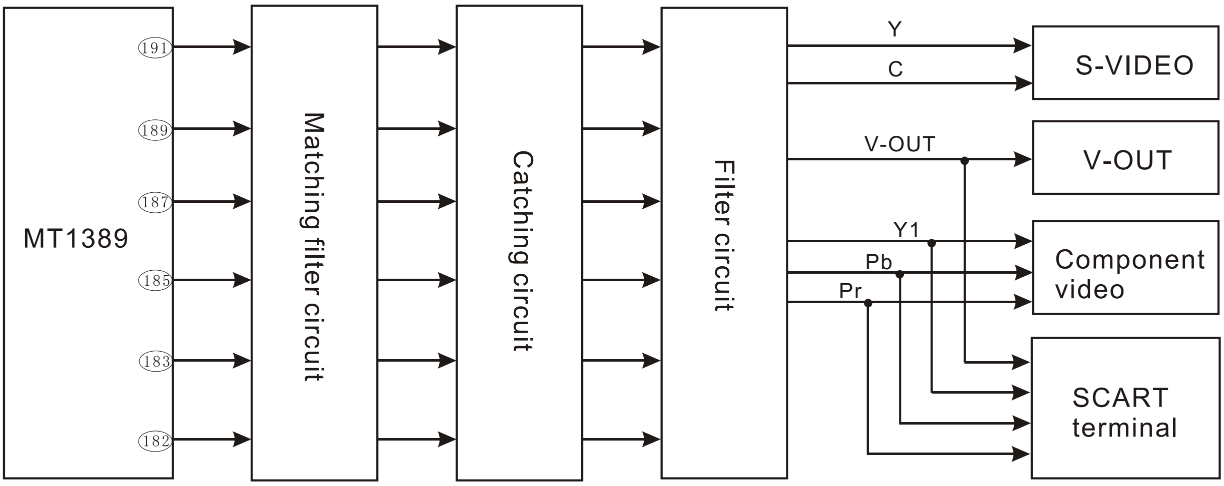


Figure 3.2.8.1 Video circuit block diagram

2. Working principle:Brightness signal, colour difference signal, CVBS signal and component video signal after being decoded by U201 (MT1389) are sent out to the corresponding terminal for output after lowpass filtering and clipping. Take Y1 signal as an instance, the following figure 3.2.8.2 shows the working principle of filtering limiter circuit.

This circuit is very simple. R261 is a matched resistor, which makes the signal achieve the maximum power on load. Capacitor C106, C108 and inductor L106 compose a lowpass filter which filters the high frequency interference signals beside useful ones; dual diode VD102 is clamping circuit. It is known from features of diode that the maximum amplitude of colour difference signal Y cannot exceed 5.7V and the minimum one cannot be under -0.7V, thus the high voltage signal from TV set can be avoided burning down the player.

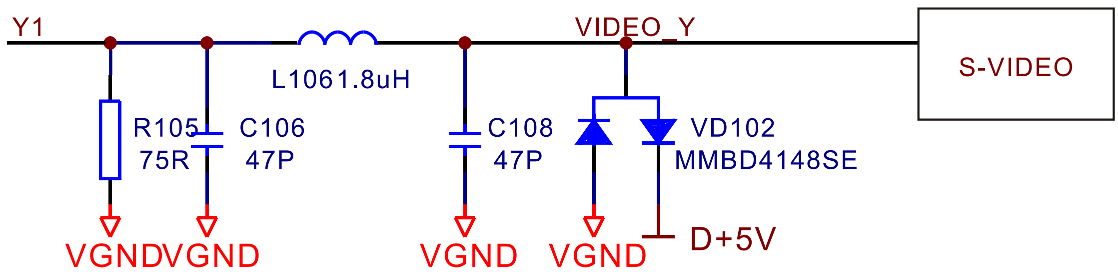


Figure 3.2.8.2 S-VIDEO output circuit diagram

3.2.9 Audio power amplifying circuit block diagram

1. Audio power amplifying circuit block diagram is shown as the following figure 3.2.9.1:

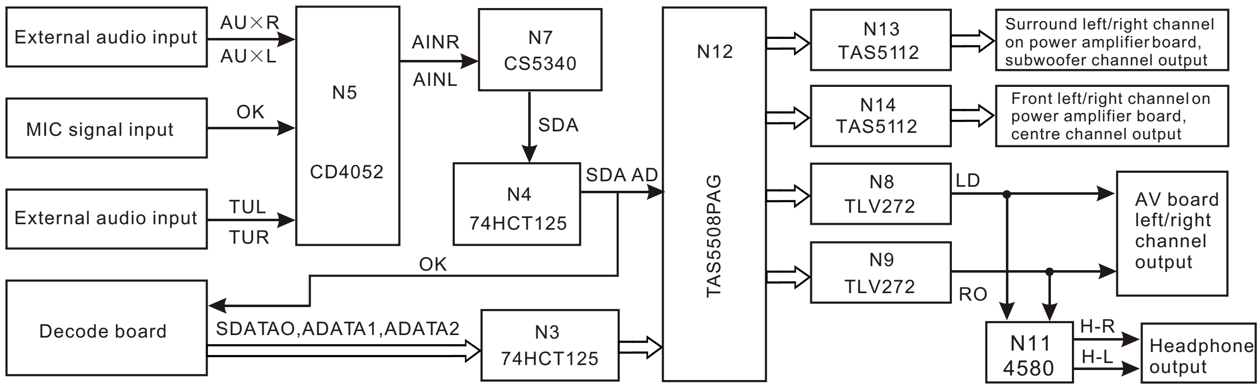


Figure 3.2.9.1 Audio power amplifying circuit block diaghram

2. Working principle:

N5 (CD4052): CD4052 is a switch for selection, which is used to select externally inputted tuning signal, MIC signal and left/right channel audio signal. When the player is in the state of playing disc, MIC signal may be on. MIC changes to digital signal after conversion of CS5340, and this digital signal outputs from pin 227 of MT1389 (ASDATO) to power amplifier board after outputting to decode for processing. Note: MIC signal through Cs5340 does not pass through N4 (74HCT125).

N7 (CS5340): converse analog signal sent out from CD4052 to digital signal for processing by back stage circuit.

N3, N4 (74HCT125): 74HCT125 is a gating IC with 4 paths in it, which can perform gating to 4 paths signals. N3 performs gating to MCLK, audio signal SDATA0, SDATA1 and SDATA2.

N12 (TAS5508): after the processing of pulse width demodulation to SDA, SDATA0, SDATA1, SDATA2 digital audio signals, 10 channel outputs generate, that is, left/right channel output on input/output board, headphone left/right channel output, front left/right channel on power amplifier board, surround left/right channel output, subwoofer channel and centre channel output.

N13, N14 (TAS5112): is a high performance amplifying IC, which demodulates and amplifies front left/right channel, surround left/right channel, centre and subwoofer after PWM of N12 (TAS5508).

3.2.10 Input/output circuit

Input/output circuit is also called AV board. AV board outputs video and audio signals sent from decode board and power amplifier board from the corresponding terminal after coupling and filter circuit processing. Externally inputted audio signal is sent to power amplifier board and decode board for processing also through AV board. Circuit includes composite video output terminal, S-video terminal

And component video output terminal; audio circuit includes mixed left/right channel output terminal, digital and optical output terminal, coaxial cable output terminal, SCART terminal, and also one path input terminal, that is left/right channel input terminal.

1. SCART terminal

SCART is a terminal that integrates video and audio together, which can transmit video and audio signals at the same time and operation is very convenient. It has 21 pins in all and lies in the middle part at rear side of the player. Pin function is shown as the following table:

Pin	Name	Signal direction	Function description	Pin	Name	Signal direction	Function description
1	A(B)OUT	I	Audio right channel input	12	NC		Network communication data line 2
2	A(B)IN	O	Audio right channel output	13	RETURN		Pr signal ground
3	A(A)OUT	I	Audio left channel input	14	RETURN		Blanking signal ground
4	A-COM		Audio signal ground	15	RED I/O	I/O	Pr signal I/O interface
5	RETURN		Pb signal ground	16	BLK I/O	I/O	Blanking signal I/O interface
6	A(A)IN	O	Audio left channel output	17	RETURN		Blanking signal ground
7	BLUE I/O	I/O	Pb signal I/O interface	18	TRTURN		Composite video signal ground
8	FUNCSW	I	Function selection interface	19	V-OUT	I	Composite video signal input
9	RETURN		Y1 signal ground	20	V-IN	O	Composite video signal output
10	CONT	I/O	Network communication data line 2	21	GND		Common
11	GREEN I/O	I/O	Y1 signal I/O interface				

Note: Blanking signal of pin 16 is used to select RGB or CVBS mode. I means inout, O means output and I/O means input/output.

2. SCART terminal function selection is shown as the following figure:

PDATO	PDAT1	PDAT2	pin 8 of SCART terminal	Function
0	___	0	10V	AV4:3()
0	___	1	7.5V	AV16:9
1	___	0	0.90V	TV
1	___	1	0.85V	TV

___	0	___	___	CVBS MODE
___	1	___	___	RGB MODE

Note: PDAT0 and PDAT2 are used to control the input voltage on pin 8 of SCART terminal. PDAT1 is used to control the voltage change on pin 16 of SCART terminal. The voltage on pin 16 controls and decides SCART selects whether RGB or CVBS mode.

3.2.11 Control panel components

1. Control panel components block diagram is shown as the following figure 3.2.11.1:

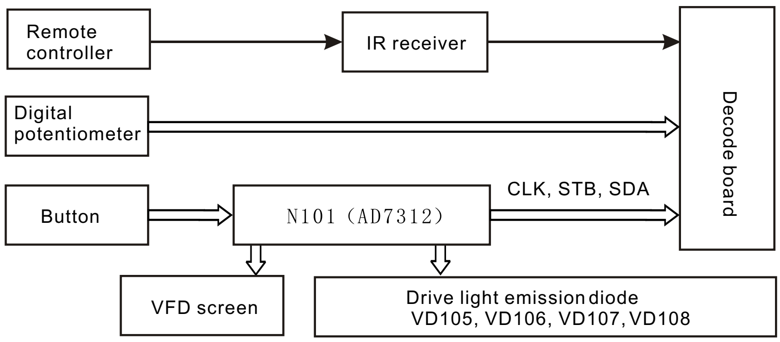


Figure 3.2.11.1 Control panel components block diagram

2. Working principle: panel is mainly composed of VFD screen, drive chip Ad7312, remote controller IR receiver, digital potentiometer, MIC jack, button and indicator light.

VFD is a vacuum fluorescence display screen and the working principle is the same with that of CRT TV set, that is, emit light and display through electron bombarding fluorescent powder. Pin 1, 2, 34 and 35 of VFD are filament power supply pin, GRID1GRID8 is segment control equal to grid, which speeds up electro emission and is responsible for display selection within reticular scope in display screen. SEG1SEG16 is bit control connected to single character with fluorescent powder on it. When electro is bombarding it, it emits light and displays character or strokes.

The function of N101 (Ad7312) is to drive display to display the corresponding state after processing data signal sent from decode board, meanwhile scan panel buttons matrix and sends it to CPU in digital signal means after processing button information to control the player and perform the corresponding acts.

Pin 3 of remote control IR receiver is 5V power supply pin, pin 2 grounds, and pin 1 is output pin. After processing remote controller buttons information, remote control receiver outputs from pin 1 and then sends to decode board directly.

Digital potentiometer is used to adjust volume, which uses the phase difference of pulse send out from pin 1 and 3 of it to realize the adjustment of volume.

3.2.12 Power supply circuit

1. Power supply circuit block diagram is shown as the following figure 3.2.12.1:

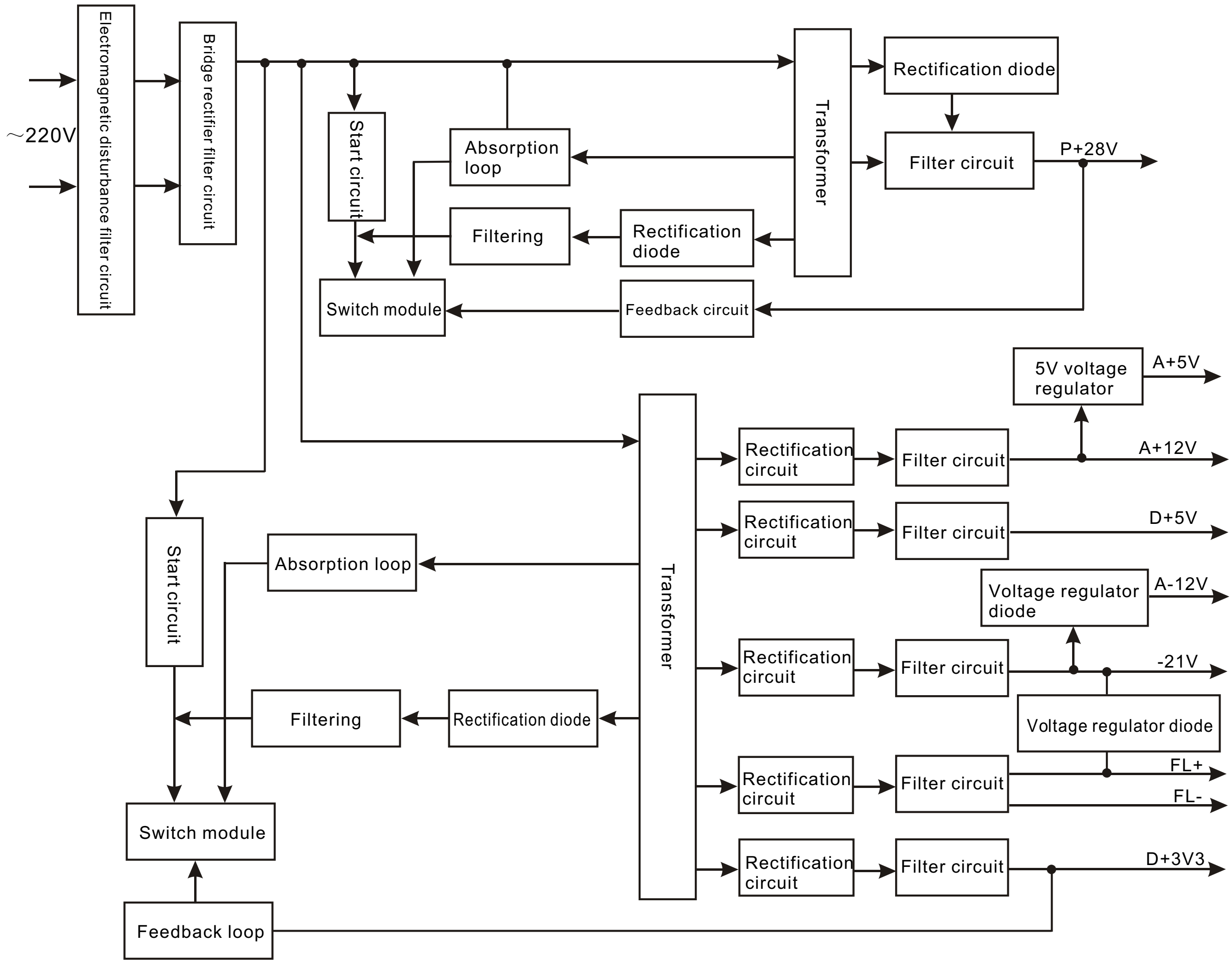


Figure 3.2.12.1 Power supply circuit block diagram

2. Working principle: this power supply circuit is composed of two parts that use electromagnetic disturbance filter circuit, bridge rectification circuit and other module circuit commonly. The first part circuit generates P+28V DC voltage used for power amplifier circuit power supply; the other part is responsible for power supply of other module circuit of this player. Working principle of each composed part is shown as follows:

(1) Electromagnetic disturbance filter circuit: for various electromagnetic radiation exist outside, the input AC will be affected. The function of electromagnetic disturbance filter capacitor is to filter these disturbance to make those that enter bridge rectification circuit are pure 220V AC.

(2) Bridge rectification and filter circuit: the function of this circuit is to generate a 310V DC to supply usage for back stage circuit.

(3) Start circuit: when power on and transformer has not started to work, start circuit provides a power supply voltage for switch module to make it work. When transformer begins to work, the voltage provided by power supply circuit for switch module is used to maintenance the working of switch module.

(4) Absorption loop: switch module performs on/off action in a very high frequency, so a very strong self induction voltage in the preliminary coil of transformer, which may probably cause the damage of switching module. The function of absorption is to form a loop for this self induction to ensure the normal working of circuit.

5) Switch module: the input from transformer is 310V DC. To make transformer work, AC shape voltage must be presented. The function of switch module is to control this 310V DC to make it on for a while and off for another while to make the input terminal of transformer generate high and low change, thus the transformer can work.

(6) Power supply circuit: provides a power supply voltage for switch module.

(7) Rectification diode: the voltage outputted from transformer just now is pulse DC. The function of rectification diode is to change pulse DC into DC together with the back filter circuit.

(8) Feedback loop: the time length of “on” and “off” inside switch module 5L0380R is decided bu feedback loop. Feedback loop samples +3.3V output voltage; when output voltage is too high, voltage sampled is on high side, through feedback loop, the space occupation ration of pin 5 of 5L0380R is changed, “on” time decreases and output voltage begins to reduce; when output voltage is too low, voltage sampled is on low side, through feedback loop, the space occupation ratio of 5L0380R increases, and output voltage increases, through the function of feedback loop, power board outputs stable voltage. LM431 used in this power is a 2.5V comparator; compare sampling voltage with this 2.5V voltage, when sampling voltage is over 2.5V (that is output voltage is high), LM431 is on, light emission diode in photoelectric coupler begins to emit light to make the other end of photoelectric coupler begin to be on; the light emission is stronger, the degree of “on” is stronger, “on” time of switch module 5L0380R decreases, output voltage begins to decrease; when sampling voltage is less than 2.5V (that is, output voltage is low), LM431 cuts off, “on” time of VEPR22 increases, output voltage increases, thus, through the auto control function of feedback loop, power board outputs stable voltage.

(9) Filter circuit: the function of it is to generate a stable and small ripple DC voltage. “ ∏ " filter is mostly used in filter circuit. The feature of capacitor filtering is that when load resistance is high and current is small, the filtering is obvious; for inductor filtering, when load resistance is small and current is big, filtering is obvious. Form capacitor to “∏ “ filter and it can exert better filtering effect.

3. Main function of each output voltage of power board:

(1) FL+, FL-: supply power for filament of panel display screen.

(2) D+5V: supply power for N101, servo drive chip U302 (D5954) and open/close door circuit.

(3) P+28V: supply power for audio power amplifying chip N13, N14 (TAS5112).

(4) A-10V, A+10V: supply power for audio power amplifying chip N1 (F4558) on power amplifier board. A+12V: supply power for tuning data processing chip N6 (SAA6558) and tuner.

(5) D+3V3: supply power for U201 (MT1389), U214 (FLASH), U211 (SDRAM) and U205 (74HCU04).

(6) A+5V (XP203 pin 5): supply power for loader.

(7) A+5V (XS504 pin 1): supply power for power amplifier board A/D conversion chip N7 (CS5340), digital audio pulse width modulating chip N12 (TAS5508), power amplifier board data selection chip N5 (CD4052), audio power amplifying chip N8 and N9 (TLV272).

Section Three Service Cases

3.3.1 Servicing cases

【Example 1】Symptom: power not on

Description: connect with power, power indicator light is not on and the player cannot be switched on.

Analysis and troubleshooting: test power board 5V, 3.3V voltage and they are both normal, check decode board 1389 chip power supply and it is 3.3V, 1.8V, which is normal; then use oscillograph to check the crystal oscillator that provides 1389 chip with 27MHZ clock frequency; check oscillation frequency and this frequency is on lower side, so we doubt that the crystal oscillator has trouble; after changing it, trouble is removed.

【Example 2】Symptom: not read DVD disc

Description: laser head focus, feed, main axis and trace are all normal, but no light emission

Analysis and troubleshooting: disconnect power supply, use multimeter to check triode Q301 and it is not damaged; LD02 and 1389HD communication is normal; power on and check working of V301 and find that V301 emitter electrode has no 3.3V power; check 3.3V power of the player and it is normal; seeing from circuit diagram, 3.3V is added to V301 emitter electrode through R301, so we doubt that the trouble is caused by R301; use resistance level (2K) of multimeter to test and find that resistance value is infinite; after changing it, V301 emitter electrode is 3.3V, which is normal, laser head emits DVD laser light normally, and trouble is removed.

【Example 3】Symptom: front power amplifier has no sound output

Description: mixed sound output of DVD AV board is normal, front power amplifier has no sound output.

Analysis and troubleshooting: use multimeter to test voltage of pin 1 of power board XS101 and it is 28V, which is normal; then test pin 1 voltage of CON4 on power amplifier board and it is also +28V, so we may judge that IC power supply is normal; use oscillograph to test whether vertical screen-shielded filtering inductor L2, L3 have waveform and find there is no waveform output, so we judge that power amplifier IC N14 may be invalid; after changing N14, trouble is removed.

【Example 4】Symptom: waveform is small

Description: left and right output waveform of mixed audio terminal are both small

Analysis and troubleshooting: left and right output waveform of mixed audio terminal are both small, when this situation appears, the possibility for the element commonly used by two branch terminals is large. Firstly check whether the flat cable between AV board and power amplifier board is well connected or disconnected, after removing the above factor, check power supply on IC with location number N8, N9 on power amplifier board and they are both +5V, N12 power supply is 3.3V, which is normal; check flat cable between power amplifier board and decode board and it is also normal; check audio signal AD conversion voltage ADACVDD3 and it is 2.4V, which is slightly small, which should be 3.3V in normal conditions; check and find that resistance on two ends of C235, C231 are infinite, so seeing from this, L207 has damaged; after changing it, trouble is removed.

【Example 5】Symptom: headphone has no sound

Description: after inserting headphone, two sides of headphone have no sound

Analysis and troubleshooting: after inserting headphone, test voltage of pin 8 on pow amplifier board X104 and it is 0, which is normal; test pin 8 voltage of N11, N8, N9 and it is +5V, which is also normal; then check pin 36 of N12 and voltage is 0, this pin is IC power supply pin and it should be 3.3V in normal conditions; use multimeter to test R113 resistance and it is infinite, this resistor has trouble; after changing it, trouble is removed.

【Example 6】Symptom: tuning has no sound

Description: when tuning, connect left channel of power amplifier and there is no sound output.

Analysis and troubleshooting: adjust in tuning state firstly, use probe of oscillograph to test pin 3, 13 of N15 and find that there is audio signals; then test pin 4 of N7 and there is no audio signals; but test pin 10, 12 and there is audio signals. Observe and find that N7 is invalid; after changing N7, trouble is removed.

【Example7】Symptom: the player not power on

Description: connect with power, blue power indicator light is on, red standby indicator light also emits light; press POWER button on the panel and the player cannot start up, red indicator light will not flash and is in standby state all the time.

Analysis and troubleshooting: check STBY signal at the moment of power on according to symptom and there will be a pulse without abnormality; seeing from this, tis trouble should lie in standby control circuit of panel; check CPU5V power voltage and it is normal; when pressing POWER button to switch on the player, check STBY signal from decode board to power board and there is no change; check power light touch switch and it is not damaged; test pin 39 of panel IC6317, after pressing POWER button, there is no 5V voltage, so we confirm that trouble should be caused by panel IC; after changing panel IC6312, trouble is removed.

【Example 8】Symptom: no MIC

Description: when speaking after inserting microphone, there is no audio output.

Analysis and troubleshooting: insert microphone and speak, use probe of oscillograph to test pin 7 of power amplifier board N1 and there is signal output; test pin 3, 13 of N5 and there is also signals; test pin 4 of N7 and there is signals; check flat cable pin 28 between power amplifier board and decode board and there is also signal; but test pin 215 of MT1389 and there is no signal; judging from this, R268 is disconnected, after changing it, trouble is removed.

【Example 9】Symptom: remote control has no function

Description: when pressing remote controller, there is not any function.

Analysis and troubleshooting: insert probe of oscillograph into pin 12 of decode board XP900; when pressing remote controller, there is not any response on oscillograph, which means remote control signals are not received; check L233, R230 and find that there is no disconnection and joint welding; contact probe with pin 1 of N102 receiver on main panel, press remote controller and there is signal skipping, which means receiver has no trouble; then connect to pin 2 of N101, press remote controller and there is no signal skipping on oscillograph; carefully observe and find that R110 has rosin joint; after welding again, trouble is removed.

【Example 10】Symptom: power amplifier has no sound

Description: line output sound is normal, when switching to tuning state, there is no sound output; after power on of this player, switch on power amplifier volume, power amplifier output has small noise.

Analysis and troubleshooting: the symptom has indicated that trouble lies in the common channel around power amplifier; check SD signal of power amplifier IC and it is 0V all the time, now power amplifier IC has been in over-current or over-heat protection state; use multimeter to test voltage to ground of each lead wire of power amplifier output end and find that voltage to ground of subwoofer channel are 9V and 5V (14.5V in normal conditions); take down L10 of this channel and test, sound restores to be normal, so we confirm that trouble is caused by L10, after changing it, trouble is removed.

【Example 11】Symptom: no OSD

Description: connect with power, panel indicator light emits light normally, press POWER button and the player starts up normally, video signal output is normal, but there is no OSD.

Analysis and troubleshooting: check display screen filament and it has ben lighted with red light emission, but without function display; use multimeter to test panel IC power supply and voltage around and they are normal; test CLK, STB, SDA signal from decode board to main panel and they are normal; test pin of main panel IC 6317 and there is no SDA signal; check main panel R112 and there is no abnormality; test resistance to ground of pin 5, 6 of panel IC 6317 and it is 1.5-ohm; after changing 6317, trouble is removed.

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for “Power not on” is shown in the figure 3.3.2.1:

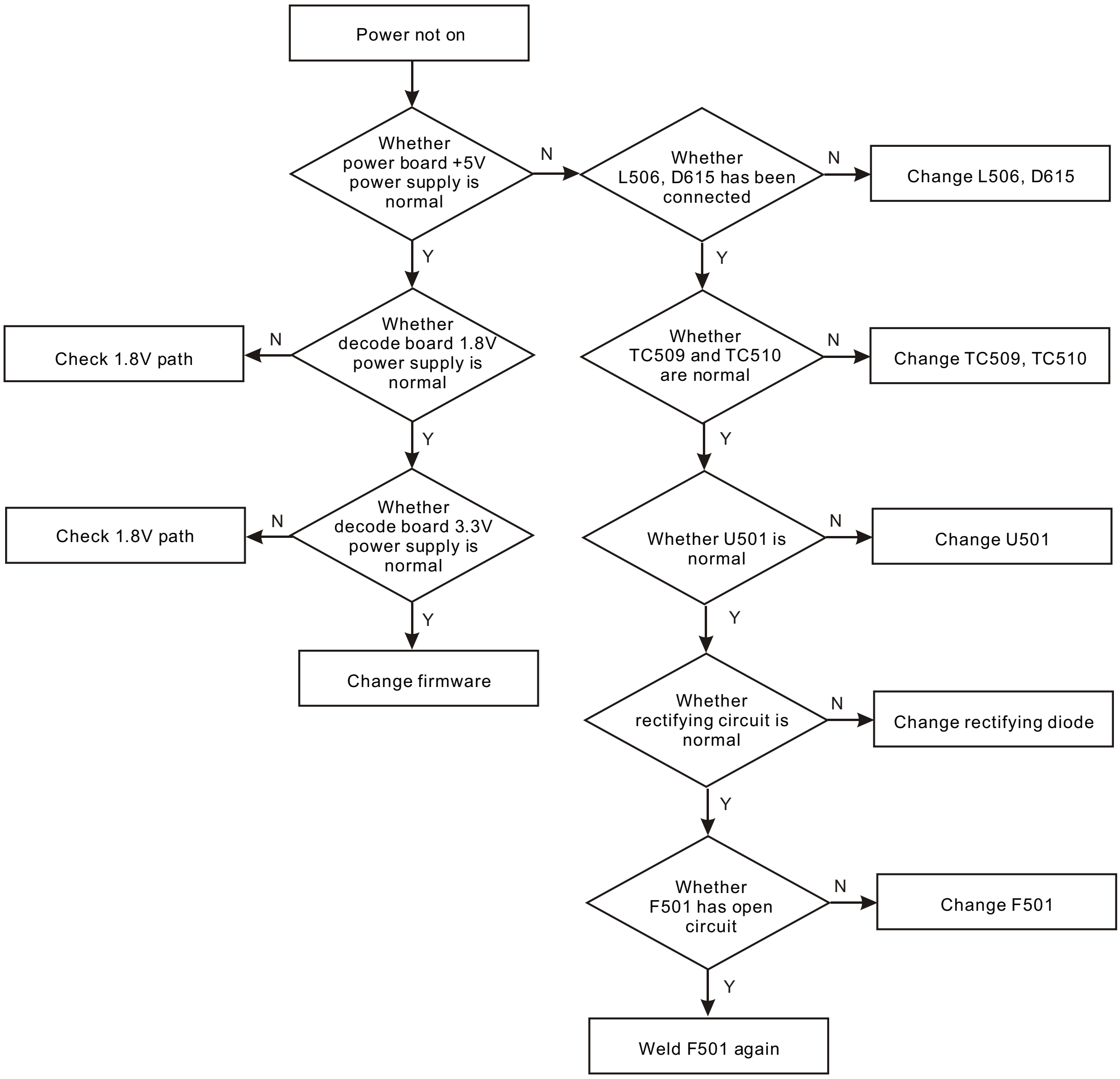


Figure 3.3.2.1 Troubleshooting flow chart for “Power not on”

2. Troubleshooting process for “Power amplifier has no output” is shown in the figure 3.3.2.2:



Figure 3.3.2.2 Troubleshooting flow chart for “Power amplifier has no output”

3. Troubleshooting process for “Headphone has no sound output” is shown in the figure 3.3.2.3:

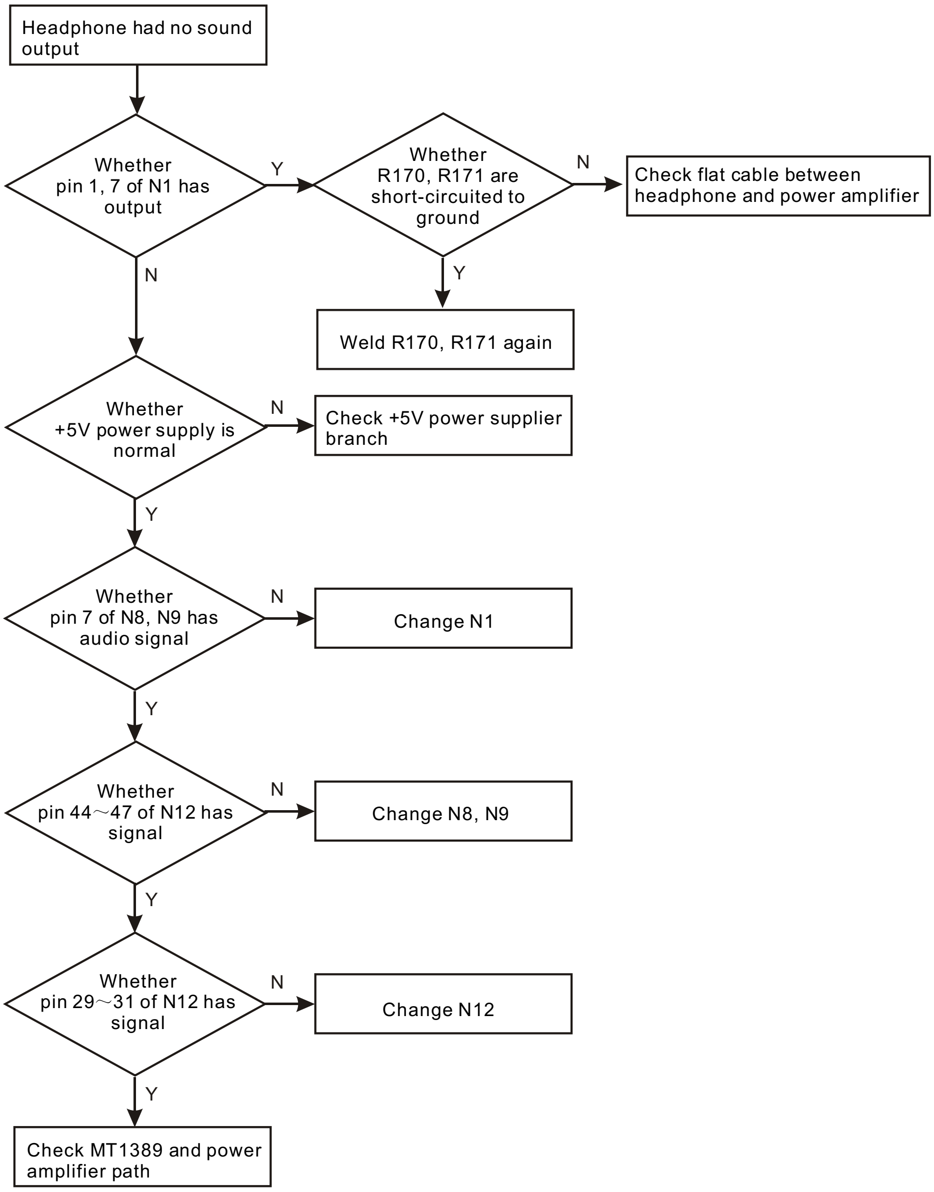


Figure 3.3.2.3 Troubleshooting flow chart for “Headphone has no sound output”

4. Troubleshooting process for “Power amplifier external input has no sound” is shown in the figure 3.3.2.4:

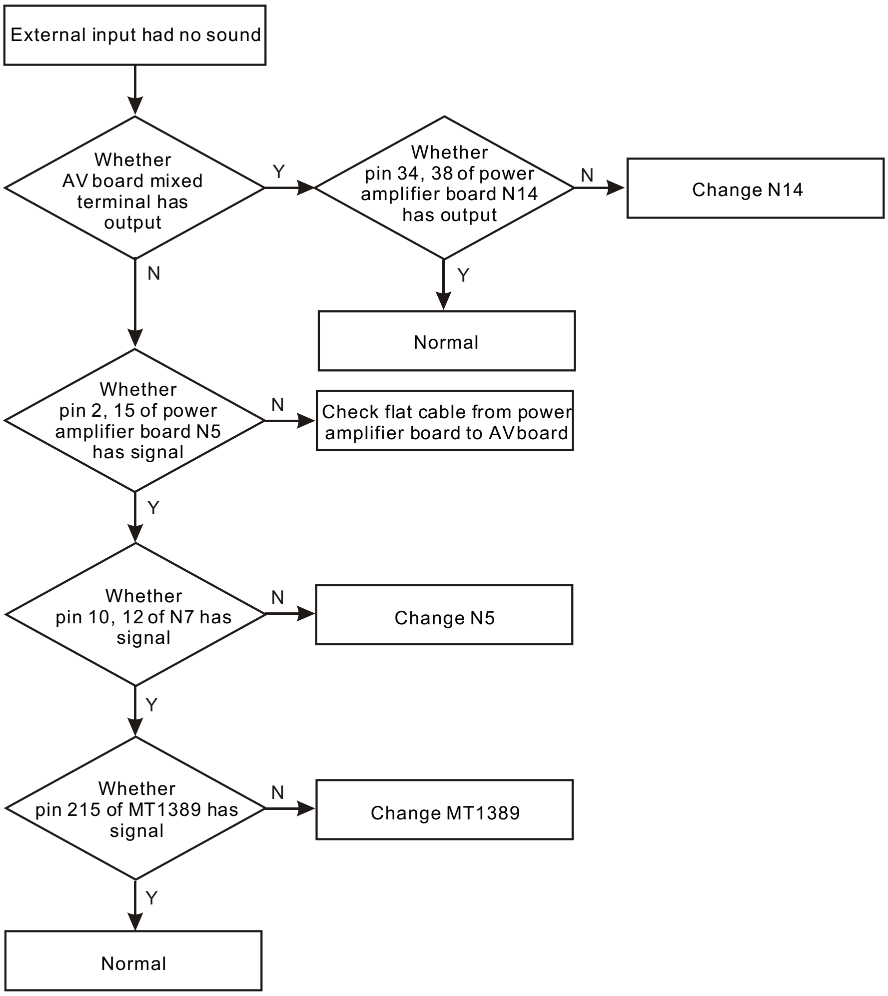


Figure 3.3.2.4 Troubleshooting flow chart for “Power amplifier external input has no sound”

5. Troubleshooting process for “Not read disc” is shown in the figure 3.3.2.5:

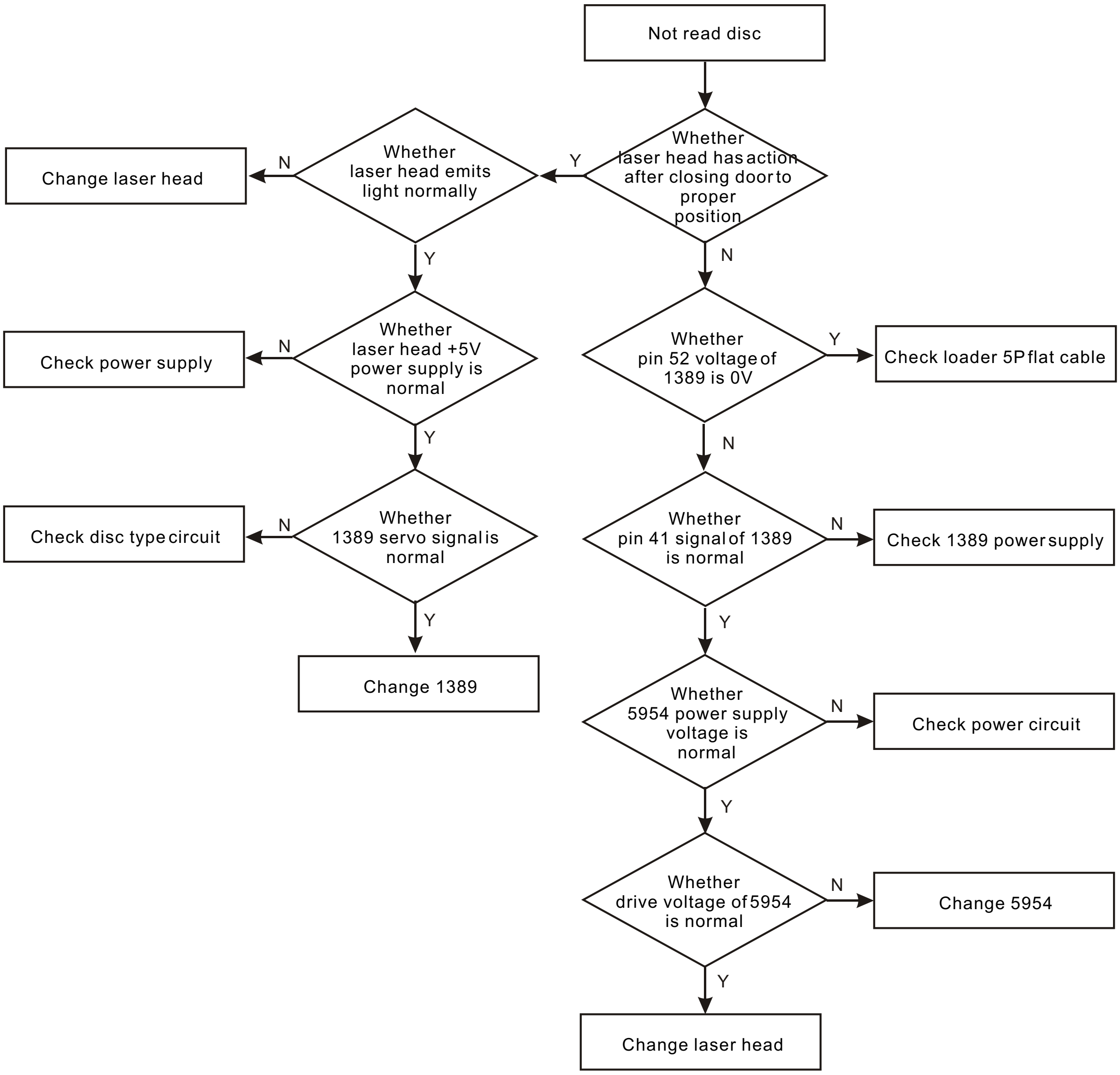


Figure 3.3.2.5 Troubleshooting flow chart for “Not read disc”

6. Troubleshooting process for "Power not on for the player" is shown in the figure 3.3.2.6:

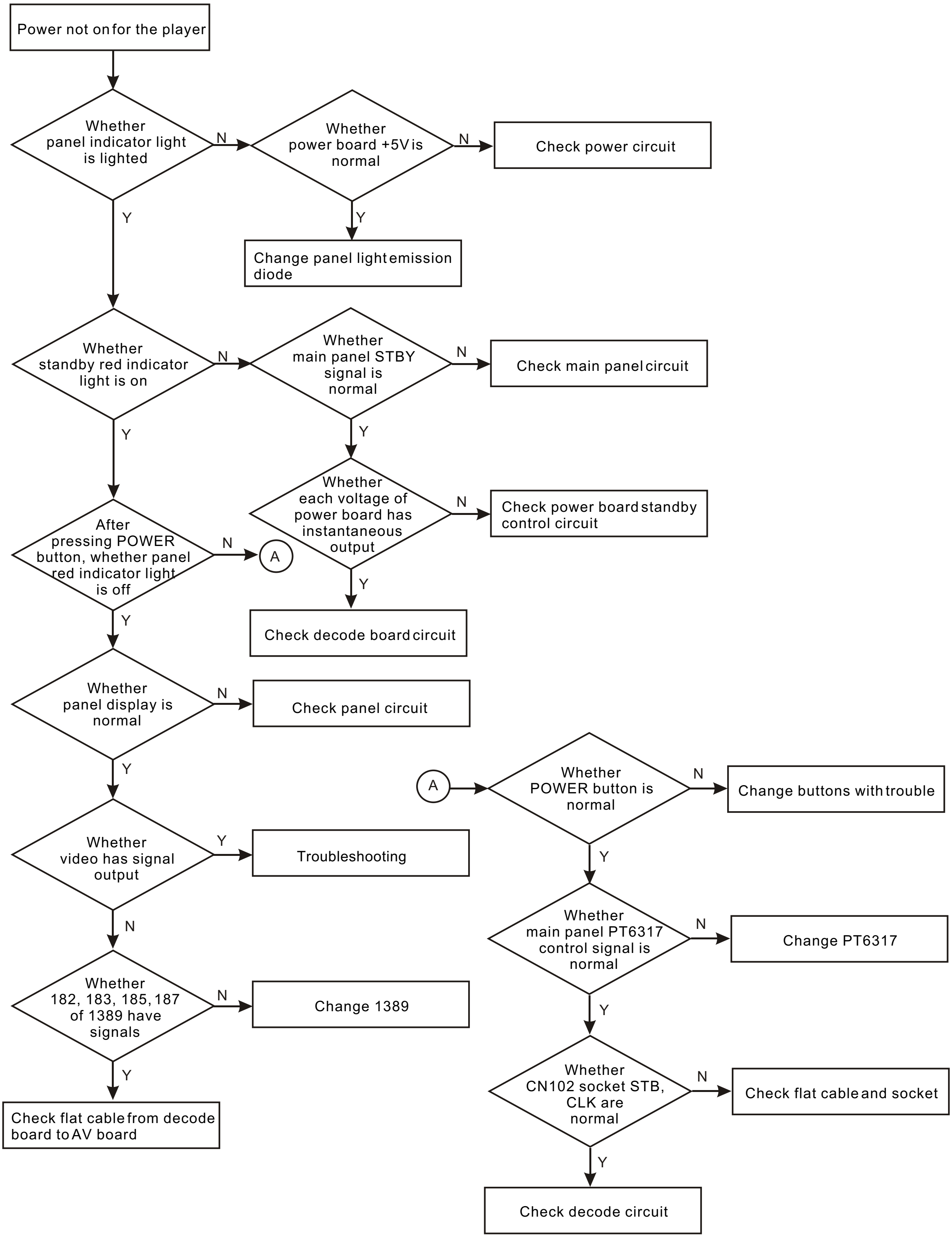
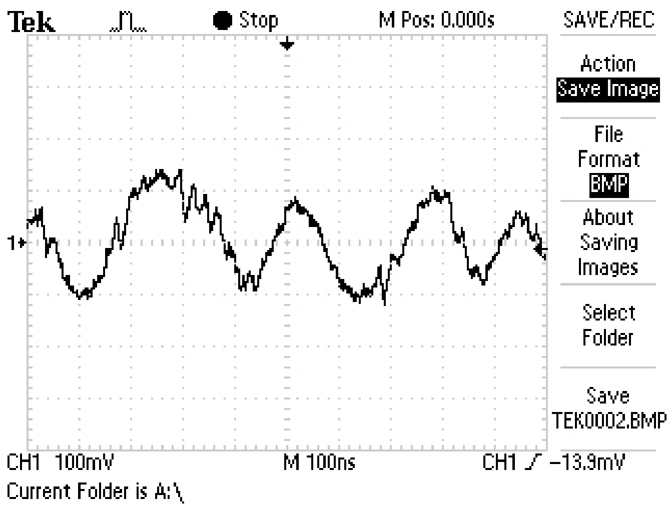


Figure 3.3.2.6 Troubleshooting flow chart for "Power not on for the player"

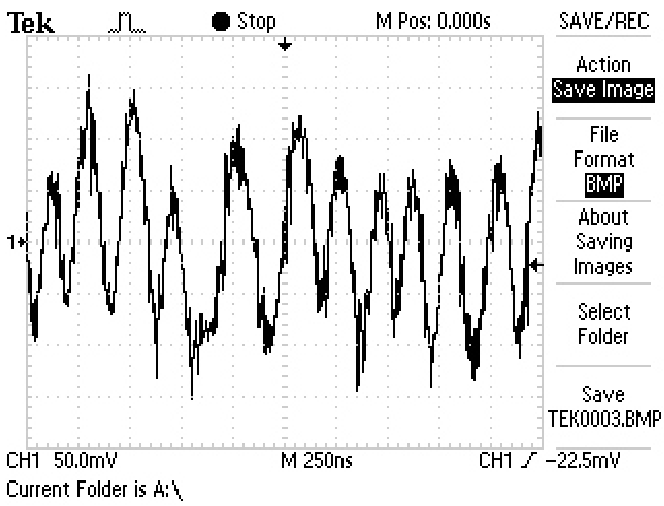
Section Four Waveform diagram

This section collects signal waveform diagram of audio, video and each unit circuit with the purpose to help servicing personnel to judge where trouble lies in accurately and quickly to improve servicing skills. For the difference of oscillograph's type, model and tuner, a certain difference may exist, so the servicing personnel are expected to pay more attention to check in daily operation.

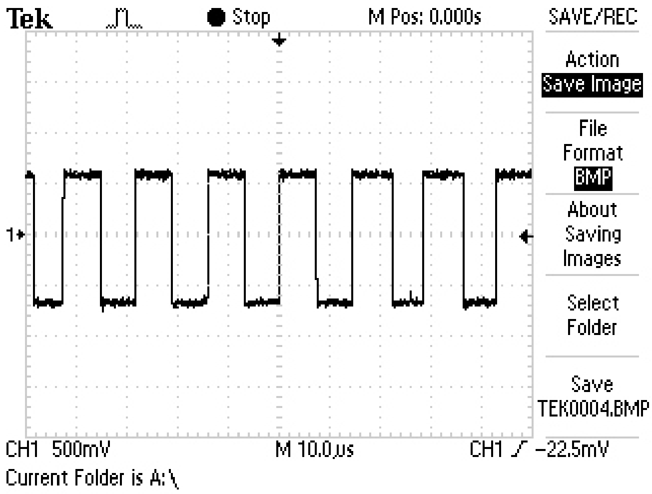
1. RFO signal waveform diagram of pin 17 of Xs301



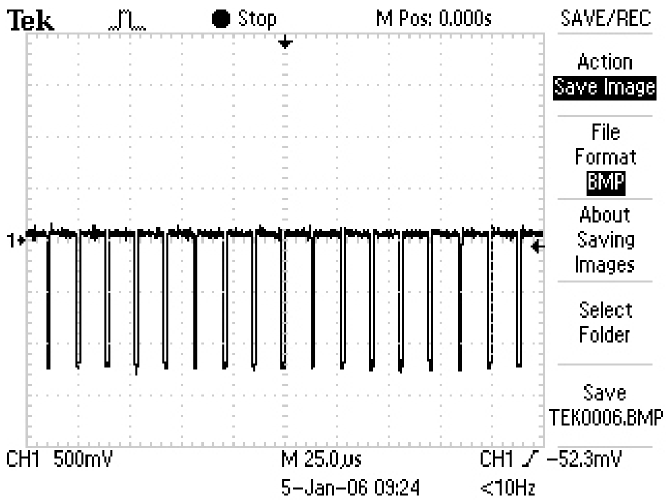
2. A signal waveform diagram of pin 16 of XS301(B、C、D、E、F)



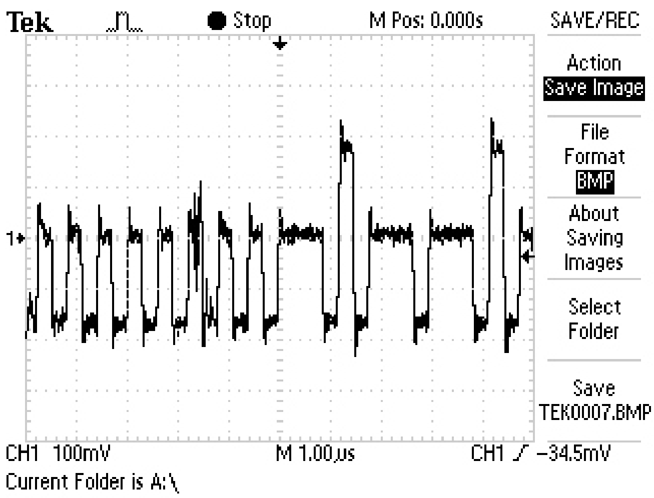
3. DMO signal (when there is main axis rotation) waveform diagram of pin 37 of U201 (MT1389)



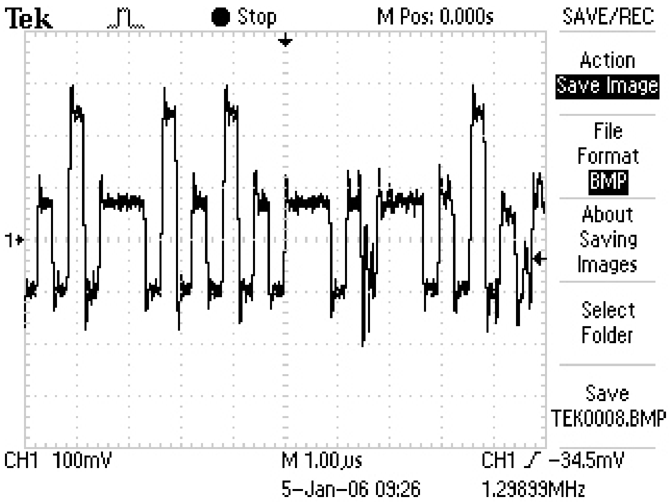
4. FMO signal (when there is feed) waveform diagram of pin 38 of U201 (MT1389)



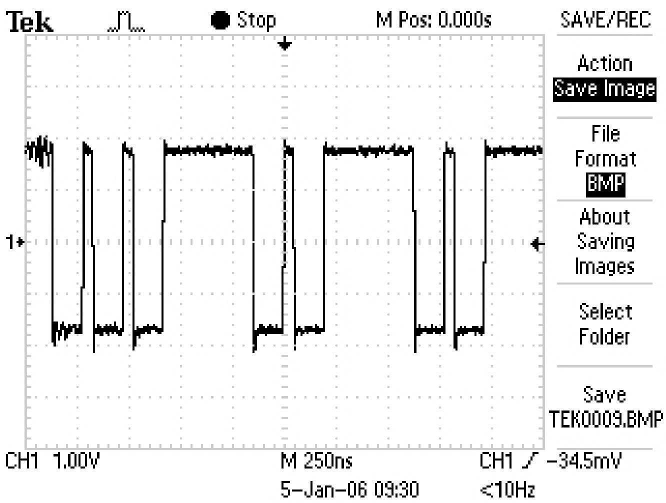
5. TRO signal (when there is trace) waveform diagram of pin 41 of U201 (MT1389)



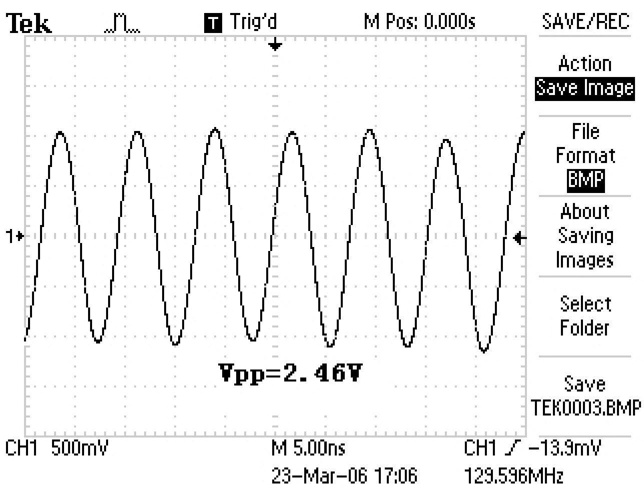
6. FOO signal (when there is focus) waveform diagram of pin 42 of U201 (MT1389)



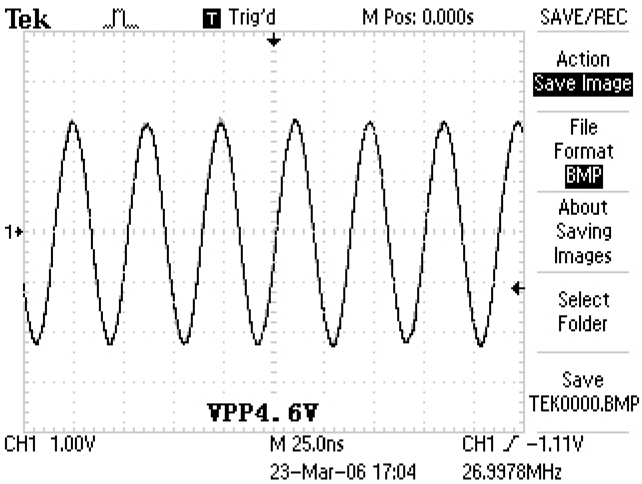
7. Waveform diagram of pin 29 (when no disc in) of U214 (FLASH)



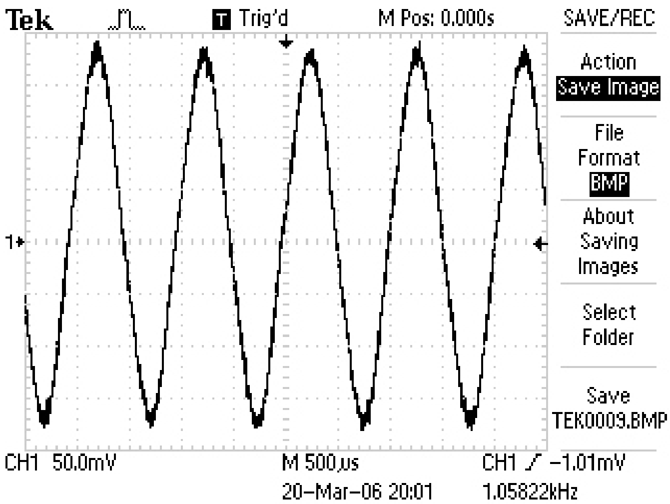
8. Waveform diagram of pin 38of U211 (SDRAM)



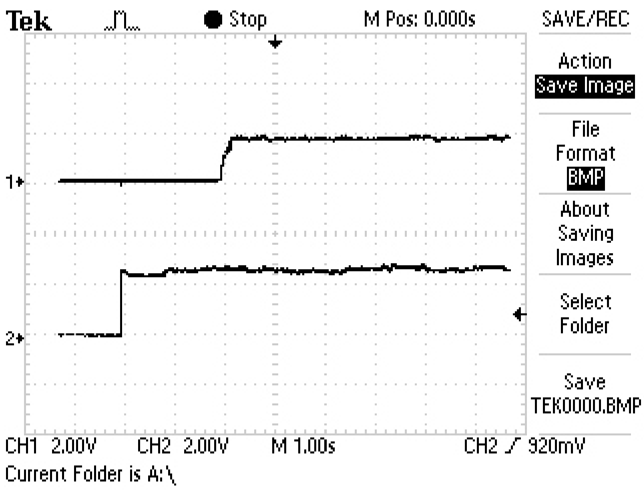
9. 27M clock signal waveform diagram



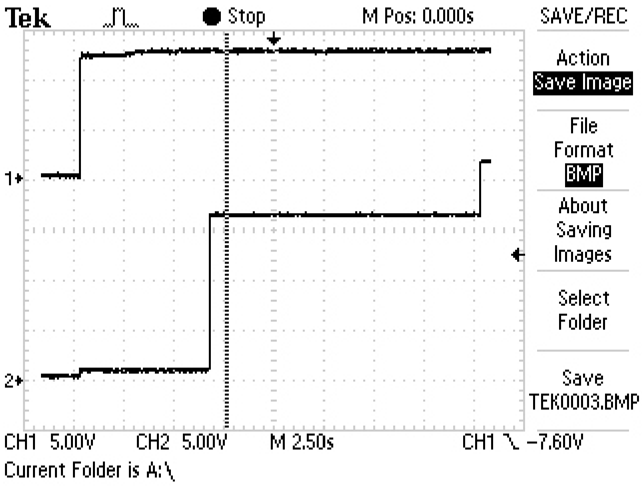
10. 1KHZ signal waveform diagram. It is suggested to use test disc, if not, the tested waveform will change at any time to affect judgment.



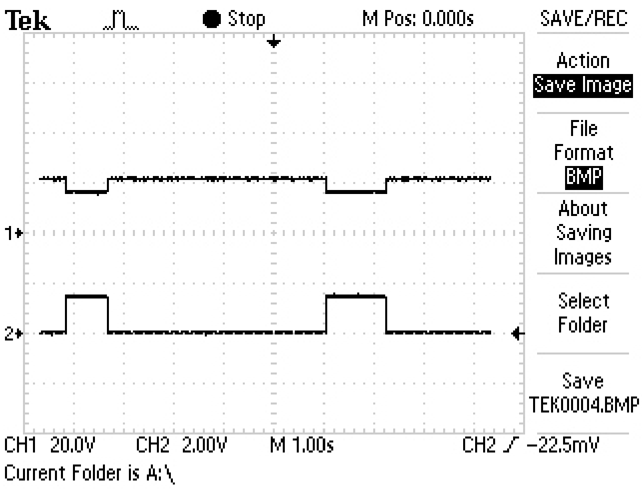
11. Waveform diagram of the comparison between reset signal (channel 1) and 3.3V voltage (channel 2)



12. Waveform diagram of the comparison between LRSWM signal (channel 2) and +12 power (channel 1) when power on. When power on, increase of LRSWM signal goes through 2 steps: the first is 0.6V with duration time 6.5 S; the second one is 16V with duration time 13.5 S.



13. Waveform diagram of the comparison between LRSWM signal (channel 1) and LRSWMUT signal (channel 2). When turning on mute, 1389 sends out low level signal LRSWMUT more than 310ms to make LRSWM signal level pull down and output mute. 1389 is muted from inside to make all channels have no output. Mute means of centre/surround channel is the same with that of main channel.



Section Five Function Introduction to IC

3.5.1 Function introduction to MT1389HD

1. Description

MT1389HD (U201) is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing.

Based on MediaTek's world-leading DVD player SOC architecture, the MT1389E is the 3rd generation of the DVD player SOC. It integrates the MediaTek 2nd generation front-end analog RF amplifier and the Servo/MPEG AV decoder.

To enrich the feature of DVD player, the MT1389 equips a simplified MPEG-4 advanced simple profile (ASP) video decoder to fully support the DivX1 Home Theater profile. It makes the MT1389-based DVD player be capable of playback MPEG-4 content which become more and more popular.

The progressive scan of the MT1389HD utilized advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback. It also supports a 3:2 pull down algorithm to give the best film effect. The 108MHz/12-bit video DAC provides users a whole new viewing experience.

2. General Feature lists

(1)Integration DVD player single chip

High performance analog RF amplifier

Servo controller and data channel processing

MPEG-1/MPEG-2/JPEG video

Dolby AC-3/DTS Decoder

Unified memory architecture

Versatile video scaling & quality enhancement

OSD & Sub-picture

Built-in clock generator

Built-in high quality TV encoder

Built-in progressive video processor

Audio effect post-processor

Built-in 5.1-ch Audio DAC

(2)High Performance Analog RF Amplifier

Programmable fc

Dual automatic laser power control

Defect and blank detection

RF level signal generator

(3)Speed Performance on Servo/Channel Decoding

DVD-ROM up to 4XS

CD-ROM up to 24XS

(4)Channel Data Processor

Digital data slicer for small jitter capability

Built-in high performance data PLL for channel data demodulation

EFM/EFM+ data demodulation

Enhanced channel data frame sync protection & DVD-ROM sector sync protection

(5)Servo Control and Spindle Motor Control

Programmable frequency error gain and phase error gain of spindle PLL to control spindle motor on CLV and CAV mode

Built-in ADCs and DACs for digital servo control

Provide 2 general PWM

Tray control can be PWM output or digital output

(6)Embedded Micro controller

Built-in 8032 micro controller

Built-in internal 373 and 8-bit programmable lower address port

1024-bytes on-chip RAM

Up to 2M bytes FLASH-programming interface

Supports 5/3.3-Volt. FLASH interface

Supports power-down mode

Supports additional serial port

(7)DVD-ROM/CD-ROM Decoding Logic

High-speed ECC logic capable of correcting one error per each P-codeword or Q-codeword

Automatic sector Mode and Form detection

Automatic sector Header verification

Decoder Error Notification Interrupt that signals various decoder errors

Provide error correction acceleration

(8)Buffer Memory Controller

Supports 16Mb/32Mb/64Mb SDRAM

Supports 16-bit SDRAM data bus

Provides the self-refresh mode SDRAM

Block-based sector addressing

(9)Video Decode

Decodes MPEG1 video and MPEG2 main level, main profile video (720/480 and 720x576)Decodes MPEG-4 Advanced Simple Profile

Support DivX 3.11/4.x/5.x Home Theater Profile

Support Nero-Digital

Smooth digest view function with I, P and B picture decoding

Baseline, extended-sequential and progressive JPEG image decoding

Support CD-G titles

(10)Video/OSD/SPU/HLI Processor

Arbitrary ratio vertical/horizontal scaling of video, from 0.25X to 256X

65535/256/16/4/2-color bitmap format OSD,

256/16 color RLC format OSD

Automatic scrolling of OSD image

(11)Audio Effect Processing

Dolby Digital (AC-3)/EX decoding

DTS/DTS-ES decoding

MPEG-1 layer 1/layer 2 audio decoding

MPEG-2 layer1/layer2 2-channel audio

High Definition Compatible Digital (HDCD)

Windows Media Audio (WMA)

Dolby ProLogic II

Concurrent multi-channel and downmix out

IEC 60958/61937 output

PCM / bit stream / mute mode

Custom IEC latency up to 2 frames

Pink noise and white noise generator

Karaoke functions

Microphone echo

Microphone tone control

Vocal mute/vocal assistant

Key shift up to +/- 8 keys

Chorus/Flanger/Harmony/Reverb

Channel equalizer

3D surround processing include virtual surround and speaker separation

(12)TV Encoder

Four 108MHz/12bit DACs

Support NTSC, PAL-BDGHINM, PAL-60

Support 525p, 625p progressive TV format

Automatically turn off unconnected channels

Support PC monitor (VGA)

Support Macrovision 7.1 L1, Macrovision 525P and 625P

CGMS-A/WSS

Closed Caption

(13)Progressive Scan Video

Automatic detect film or video source

3:2 pull down source detection

Advanced Motion adaptive de-interlace

Minimum external memory requirement

(14)Outline

216-pin LQFP package

3.3/1.8-Volt. Dual operating voltages

3. Pin Definitions

PIN	Main	Alt	Type	Description
RF interface (26)				
231	RFGND18		Ground	Analog ground
132	RFVDD 18		Power	Analog power 1.8V
252	OSP		Analog output	RF Offset cancellation capacitor connecting
253	OSN		Analog output	RF Offset cancellation capacitor connecting
254	RFGC		Analog output	RF AGC loop capacitor connecting for DVD-ROM
255	IREF		Analog input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS
256	AVDD3		Power	Analog power 3.3V
1	AGND		Ground	Analog ground
2	DVDA		Analog input	AC couple input path A
3	DVDB		Analog input	AC couple input path B
4	DVDC		Analog input	AC couple input path C
5	DVDD		Analog input	AC couple input path D
6	DVDRFIP		Analog input	AC coupled DVD RF signal input RFIP
7	DVDRFIN		Analog input	AC coupled DVD RF signal input RFIN
8	MA		Analog input	DC coupled main beam RF signal input A

9	MB		Analog input	DC coupled main beam RF signal input B
10	MC		Analog input	DC coupled main beam RF signal input C
11	MD		Analog input	DC coupled main beam RF signal input D
12	SA		Analog input	DC coupled sub-beam RF signal output A
13	SB		Analog input	DC coupled sub-beam RF signal output B
14	SC		Analog input	DC coupled sub-beam RF signal output C
15	SD		Analog input	DC coupled sub-beam RF signal output D
16	CDFON		Analog input	CD focusing error negative input
17	CDFOP		Analog input	CD focusing error positive input
18	TNI		Analog input	3 beam satellite PD signal negative input
19	TPI		Analog input	3 beam satellite PD signal positive input
ALPC (4)				
20	MIDI1		Analog input	Laser power monitor input
21	MIDI2		Analog input	Laser power monitor input
22	LDO2		Analog output	Laser driver output
23	LDO1		Analog output	Laser driver output
ADC Power (2)				
244	ADCVDD3		Power	Analog 3.3V Power for ADC
245	ADCVSS		Ground	Analog ground for ADC
VPLL (3)				
43	VPLLVSS		Ground	Analog ground for VPLL
44	CAPPAD		Analog Inout	VPLL External Capacitance connection
45	VPLLVDD3		Power	Analog 3.3V Power for VPLL
Reference voltage (3)				
28	V2REFO		Analog output	Reference voltage 2.8V
29	V20		Analog output	Reference voltage 2.0V
30	VREFO		Analog output	Reference voltage 1.4V
Analog monitor output (7)				
24	SVDD3		Power	Analog power 3.3V
25	CSO	RFOP	Analog output	1) Central servo 2) Positive main beam summing output
26	RFLVL	RFON	Analog output	1) RFRP low pass, or 2) Negative main beam summing output
27	SGND		Ground	Analog ground

31	FEO		Analog output	Focus error monitor output
32	TEO		Analog output	Tracking error monitor output
33	TEZISLV		Analog output	TE slicing Level
Analog monitor output (6)				
246	RFVDD3		Analog output	Analog Power
247	RFRPDC		Analog Input	RF ripple detect output
248	RFRPAC		Analog output	RF ripple detect input(through AC-coupling)
249	HRFZC		Analog output	High frequency RF ripple zero crossing
250	CRTPLP		Analog output	Defect level filter capacitor connecting
251	RFGND		Ground	Analog Power
RF Data PLL Interface (9)				
235	JITFO		Analog output	Output terminal of RF jitter meter
236	JITFN		Analog Input	Input terminal of RF jitter meter
237	PLLVSS		Ground	Ground pin for data PLL and related analog circuitry
238	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
239	PLLVDD3		Power	Power pin for data PLL and related analog circuitry
240	LPFON		Analog Output	Negative output of loop filter amplifier
241	LPFIP		Analog input	Positive input terminal of loop filter amplifier
242	LPFIN		Analog input	Negative input terminal of loop filter amplifier
243	LPFOP		Analog output	Positive output of loop filter amplifier
Motor and Actuator Driver Interface (10)				
34	OP_OUT		Analog output	Op amp output
35	OP_INN		Analog input	Op amp negative input
36	OP_INP		Analog input	Op amp positive input
37	DMO		Analog output	Disk motor control output. PWM output
38	FMO		Analog output	Feed motor control. PWM output
39	TROPENPWM		Analog output	Tray PWM output/Tray open output
40	PWMOUT1	ADIN0	Analog output	1) 1st General PWM output 2) AD input 0
41	TRO		Analog output	Tracking servo output. PDM output of tracking servo compensator
42	FOO		Analog output	Focus servo output. PDM output of focus servo compensator

50	FG (Digital pin)	ADIN1 GPIO	LVTTL3.3 Input, Schmitt input, pull up, with analog input path for ADIN1	1) Monitor hall sensor input 2) AD input 1 3) GPIO
General Power/Ground (18)				
55 93 142 160 174 213	DVDD18		Power	1.8V power pin for internal digital circuitry
81 178	DVSS		Ground	1.8V ground pin for internal digital circuitry
65 96 118 131 145 156 170 208	DVDD3		Power	3.3V power pin for internal digital circuitry
90 148	DVSS		Ground	3.3V ground pin for internal digital circuitry
Micro Controller and Flash Interface (48)				
62	HIGHA0		InOut 4~16mA,SRPU	Microcontroller address 8
74	HIGHA1		InOut 4~16mA,SRPU	Microcontroller address 9
73	HIGHA2		InOut 4~16mA,SRPU	Microcontroller address 10
72	HIGHA3		InOut 4~16mA,SRPU	Microcontroller address 11
71	HIGHA4		InOut 4~16mA,SRPU	Microcontroller address 12
70	HIGHA5		InOut 4~16mA,SRPU	Microcontroller address 13
69	HIGHA6		InOut 4~16mA,SRPU	Microcontroller address 14
68	HIGHA7		InOut 4~16mA,SRPU	Microcontroller address 15
89	AD7		InOut 4~16mA,SRPU	Microcontroller address/data 7
86	AD6		InOut 4~16mA,SRPU	Microcontroller address/data 6
85	AD5		InOut 4~16mA,SRPU	Microcontroller address/data 5

84	AD4		InOut 4~16mA,SRPU	Microcontroller address/data 4
83	AD3		InOut 4~16mA,SRPU	Microcontroller address/data 3
82	AD2		InOut 4~16mA,SRPU	Microcontroller address/data 2
80	AD1		InOut 4~16mA,SRPU	Microcontroller address/data 1
79	AD0		InOut 4~16mA,SRPU	Microcontroller address/data 0
92	IOA 0		InOut 4~16mA,SRPU	Microcontroller address
77	IOA 1		InOut 4~16mA,SRPU	Microcontroller address 1/ IO
56	IOA 2		InOut 4~16mA,SRPU	Microcontroller address 2/ IO
57	IOA 3		InOut 4~16mA,SRPU	Microcontroller address 3/ IO
58	IOA 4		InOut 4~16mA,SRPU	Microcontroller address 4/ IO
59	IOA 5		InOut 4~16mA,SRPU	Microcontroller address 5/ IO
60	IOA 6		InOut 4~16mA,SRPU	Microcontroller address 6/ IO
61	IOA 7		InOut 4~16mA,SRPU	Microcontroller address 7/ IO
67	A16		InOut 4~16mA,SRPU	Flash address 16
91	A17		InOut 4~16mA,SRPU	Flash address 17
63	A18		InOut 4~16mA, SRPD,SMT	Flash address 18 /IO
64	A19		InOut 4~16mA, SRPD,SMT	Flash address 19 /IO
75	A20	YUV0	InOut 4~16mA, SRPD,SMT	5) Flash address 20 /IO 6) While External Flash size <= 1MB: I) Alternate digital video YUV output 0
87	A21	YUV7 GPIO	InOut 4~16mA, SRPD,SMT	7) Flash address 21 /IO 8) While External Flash size <= 2MB: I) Digital video YUV output 7 II) GPIO
88	ALE		InOut 4~16mA, SRPD,SMT	Microcontroller address latch enable
78	IOOE#		InOut 4~16mA, SRPD,SMT	Flash output enable, active low / IO
66	IOWR#		InOut 4~16mA, SRPD,SMT	Flash write enable, active low / IO
76	IOCS#		InOut 4~16mA, SRPD,SMT	Flash chip select, active low / IO
94	UWR#		InOut 4~16mA, SRPD,SMT	Microcontroller write strobe, active low

95	URD#		InOut 4mA, SRPD,SMT	Microcontroller read strobe, active low
97	UP1_2		InOut 4~16mA, SRPD,SMT	Microcontroller port 1-2
98	UP1_3		InOut 4mA, SRPD,SMT	Microcontroller port 1-3
99	UP1_4		InOut 4mA, SRPD,SMT	Microcontroller port 1-4
100	UP1_5		InOut 4mA, SRPD,SMT	Microcontroller port 1-5
101	UP1_6	SCL	InOut 4mA, SRPD,SMT	1) Microcontroller port 1-6 2) I2C clock pin
102	UP1_7	SDA	InOut 4mA, SRPD,SMT	1) Microcontroller port 1-7 1) I2C data pin
103	UP3_0	RXD	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-0 2) 8032 RS232 RxD
104	UP3_1	TXD	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-1 2) 8032 RS232 TxD
105	UP3_4	RXD SCL	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-4 2) Hardwired RD232 RxD 3) I2C clock pin
106	UP3_5	RXD SDA	InOut 4~16mA, SRPD,SMT	1) Microcontroller port 3-5 2) Hardwired RD232 TxD 3) I2C data pin
109	IR		Input SMT	IR control signal input
110	INT0#		InOut 4~16mA, SRPD,SMT	Microcontroller external interrupt 0, active low
Audio interface (28)				
204	SPMCLK	SCLK0	Inout	1) Audio DAC master clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 clock pin II) GPIO
205	SPDATA	SDIN0	Inout	1) Audio data of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-in II) GPIO

206	SPLRCK	SDO0	Inout	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
207	SPBCK	SDCS0 ASDATA 5	Inout	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer Channel or Microphone output III) GPIO
209	ALRCK		InOut 4mA, PD,SMT	1) Audio left/right channel clock 2) Trap value in power-on reset: I) 1: use external 373 II) 0: use internal 373
210	ABCK	Fs64	InOut 4mA, SMT	1) Audio bit clock 2) Phase de-modulation
211	ACLK		InOut 4mA, SMT	Audio DAC master clock
197	ASDATA0		InOut 4mA, PD,SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels:) GPO_2
202	ASDATA1		InOut 4mA, PD,SMT	2) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data right channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels: I) GPO_2
203	ASDATA2		InOut 4mA, PD,SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data left surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels: I) GPO_1

212	ASDATA3		InOut 4mA, PD,SMT	1) Audio serial data 2 (Center/LFE) 2) DSD data right surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While only 2 channels output: I) GPO_0
214	ASDATA4	INT1#	InOut 4mA, PD,SMT	1) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 2) DSD data center channel 18) While only 2 channels output: I) Digital video YUV output 6 II) GPIO
215	MC_DATA	INT2#	InOut 2mA, PD,SMT	1) Microphone serial input 2) While not support Microphone: I) Microcontroller external interrupt 2 II) GPIO
216	SPDIF		Output 4~16mA, SR: ON/OFF	S/PDIF output
217	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
218	APLLCAP		Analog inout	APLL External Capacitance connection
219	APLLVSS		Ground	Ground pin for audio clock circuitry
220	ADACVSS2		Ground	Ground pin for AUDIO DAC circuitry
221	ADACVSS1		Ground	Ground pin for AUDIO DAC circuitry
222	ARF		Output	1) AUDIO DAC Sub-woofer channel output 2) While internal AUDIO DAC not used: GPIO
223	ARS	GPIO	Output	1) AUDIO DAC Right Surround channel output 2) While internal AUDIO DAC not used: a. SDATA3 b. GPIO
224	AR	GPIO	Output	1) AUDIO DAC Right channel output 2) While internal AUDIO DAC not used: a. SDATA1 b. GPIO
225	AVCM		Analog	AUDIO DAC reference voltage

226	AL	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a. SDATA2 b. GPIO
227	ALS	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a.SDATA0 b. GPIO
228	ALF	GPIO	Output	1) AUDIO DAC Center channel output 2) While internal AUDIO DAC not used: GPIO
229	ADACVDD1		Power	3.3V power pin for AUDIO DAC circuitry
230	ADACVDD2		Power	3.3V power pin for AUDIO DAC circuitry
Video Interface (18)				
196	DACVDDC		Power	3.3V power pin for VIDEO DAC circuitry
195	VREF		Analog	Bandgap reference voltage
194	FS		Analog	Full scale adjustment
193	YUV0	CIN	Output 4MA, SR	1) Video data output bit 0 2) Compensation capacitor
192	DACVSSC		Ground	Ground pin for VIDEO DAC circuitry
191	YUV1	Y	Output 4MA, SR	1) Video data output bit 1 2) Analog Y output
190	DACVDDB		Power	3.3V power pin for VIDEO DAC circuitry
189	YUV2	C	Output 4MA, SR	1) Video data output bit 2 2) Analog chroma output
188	DACVSSB		Ground	Ground pin for VIDEO DAC circuitry
187	YUV3	CVBS	Output 4MA, SR	1) Video data output bit 3 2) Analog composite output
186	DACVDDA		Power	3.3V power pin for VIDEO DAC circuitry
185	YUV4	Y/G	Output 4MA, SR	1) Video data output bit 4 2) Green or Y
184	DACVSSA		Ground	Ground pin for VIDEO DAC circuitry
183	YUV5	B/Cb/Pb	Output 4MA, SR	1) Video data output bit 5 2) Blue or CB
182	YUV6	R/Cr/Pr	Output 4MA, SR	1) Video data output bit 6 2) Red or CR

181	VSYN	V_ADIN1	Output 4MA, SR	1) Vertical sync input/output 2) While no External TV-encoder: I) Vertical sync for video-input II) Version AD input port 1 III) GPIO
180	YUV 7	INT3# ASDATA 5	Output 4MA, SR	1) Video data output bit 7 2) While no External TV-encoder: I) Microcontroller external interrupt 3 II) Audio serial data 5 part II : DSD data sub-woofer channel or Microphone output III) GPIO
179	HSYN	INT4# V_ADIN2	Output 4MA, SR	1) Horizontal sync input/output 2) While no External TV-encoder: I) Horizontal sync for video-input II) Version AD input port 2 III) GPIO IV) Microcontroller external interrupt 4
Video Interface (12)				
160	DACVDDC		Power	3.3V power pin for video DAC circuitry
161	VREF		Analog	Bandgap reference voltage
162	FS		Analog	Full scale adjustment
163	DACVSSC		Ground	Ground pin for video DAC circuitry
164	CVBS		InOut 4mA, SR	Analog composite output
165	DACVDDB		Power	3.3V power pin for video DAC circuitry
166	DACVSSB		Ground	Ground pin for video DAC circuitry
167	DACVDDA		Power	3.3V power pin for video DAC circuitry
168	Y/G		InOut 4mA, SR	Green, Y, SY, or CVBS
169	DACVSSA		Ground	Ground pin for video DAC circuitry
170	B/CB/PB		InOut 4mA, SR	Blue, CB/PB, or SC
171	R/CR/PR		InOut 4mA, SR	Red, CR/PR, CVBS, or SY
MISC (12)				

108	PRST#		InOut PD,SMT	Power on reset input, active low
107	ICE		InOut PD,SMT	Microcontroller ICE mode enable
233	XTALO		Output	27MHz crystal output
234	XTALI		Input	27MHz crystal input
46	USB_VSS		USB Ground	USB ground pin
47	USBP		Analog Inout	USB port DPLUS analog pin
48	USBM		Analog Inout	USB port DMINUS analog pin
49	USB_VDD3		Analog Inout	USB Power pin 3.3V
201	GPIO3		InOut Pull-Down	GPIO
200	GPIO4		InOut Pull-Down	GPIO
199	RCLKB	GPIO5	InOut Pull-Down	GPIO
198	RVREF	GPIO6	InOut Pull-Down	GPIO
Dram Interface (58) (Sorted by position)				
176	C_0	IO_0(RD16)	InOut Non-pull	1) Digital Video output C bit 0 2) GPIO
175	C_1	IO_1(RD17)	InOut Non-pull	1) Digital Video output C bit 1 2) GPIO
173	C_2	IO_2(RD18)	InOut Non-pull	1) Digital Video output C bit 2 2) GPIO
172	C_3	IO_3(RD19)	InOut Non-pull	1) Digital Video output C bit 3 2) GPIO
171	C_4	IO_4(RD20)	InOut Non-pull	1) Digital Video output C bit 4 2) GPIO
169	C_5	IO_5(RD21)	InOut Non-pull	1) Digital Video output C bit 5 2) GPIO
168	C_6	IO_6(RD22)	InOut Non-pull	1) Digital Video output C bit 6 2) GPIO
167	C_7	IO_7(RD23)	InOut Non-pull	1) Digital Video output C bit 7 2) GPIO
177	IO_17	(DQM2)	InOut Pull- Up	GPIO
166	YUVCLK	IO_8(DQM3)	InOut Pull- Up	1) Digital Video output Clock 2) GPIO
165	Y_0	IO_9(RD24)	InOut Non-pull	1) Digital Video output Y bit 0 2) GPIO

164	Y_1	IO_10(RD 25)	InOut Non-pull	1) Digital Video output Y bit 1 2) GPIO
163	Y_2	IO_11(RD 26)	InOut Non-pull	1) Digital Video output Y bit 2 2) GPIO
162	Y_3	IO_12(RD 27)	InOut Non-pull	1) Digital Video output Y bit 3 2) GPIO
161	Y_4	IO_13(RD 28)	InOut Non-pull	1) Digital Video output Y bit 4 2) GPIO
159	Y_5	IO_14(RD 29)	InOut Non-pull	1) Digital Video output Y bit 5 2) GPIO
158	Y_6	IO_15(RD 30)	InOut Non-pull	1) Digital Video output Y bit 6 2) GPIO
157	Y_7	IO_16(RD 31)	InOut Non-pull	1) Digital Video output Y bit 7 2) GPIO
155	RA4		InOut	DRAM address 4
154	RA5		InOut	DRAM address 5
153	RA6		InOut	DRAM address 6
152	RA7		InOut	DRAM address 7
151	RA8		InOut	DRAM address 8
150	RA9		InOut	DRAM address 9
149	RA11		InOut	DRAM address bit 11
147	CKE		InOut Pull-Down	DRAM clock enable
146	RCLK		InOut	Dram clock
144	RA3		InOut	DRAM address 3
143	RA2		InOut	DRAM address 2
141	RA1		InOut	DRAM address 1
140	RA0		InOut	DRAM address 0
139	RA10		InOut	DRAM address 10
138	BA1		InOut	DRAM bank address 1
137	BA0		InOut	DRAM bank address 0
136	RCS#		output	DRAM chip select, active low
135	RAS#		output	DRAM row address strobe, active low
134	CAS#		output	DRAM column address strobe, active low
133	RWE#		output	DRAM Write enable, active low

132	DQM1		InOut	Data mask 1
130	IO_18	(DQS1)	InOut Non-pull	GIPIO
129	RD8		InOut	DRAM data 8
128	RD9		InOut	DRAM data 9
127	RD10		InOut	DRAM data 10
126	RD11		InOut	DRAM data 11
125	RD12		InOut	DRAM data 12
124	RD13		InOut	DRAM data 13
123	RD14		InOut	DRAM data 14
125	RD15		InOut	DRAM data 15
121	RD0		InOut	DRAM data 0
120	RD1		InOut	DRAM data 1
119	RD2		InOut	DRAM data 2
117	RD3		InOut	DRAM data 3
116	RD4		InOut	DRAM data 4
115	RD5		InOut	DRAM data 5
114	RD6		InOut	DRAM data 6
113	RD7		InOut	DRAM data 7
112	IO_19	(DQS0)	InOut	GPIO
111	DQM0		InOut Non-pull	Data mask 0
JTAG Interface(4)				
51	TDI	V_ADIN4	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 4 3) GPIO
52	TMS	V_ADIN5	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 5 3) GPIO
53	TCK	V_ADIN6	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 6 3) GPIO
54	TDO	V_ADIN7	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 7 3) GPIO

3.5.2 function introduction to AT24C02

1. Description

The AT24C02 (U202) provides 2048 bits of serial electrically erasable and programmable read-only memory (EEPROM) organized as 256 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low-power and low-voltage operation are essential. The AT24C02 is available in space-saving 8-lead PDIP,

8-lead MAP, 8 lead TSSOP and 8-ball dBGA2 packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 2.7V (2.7V to 5.5V) and 1.8V (1.8V to 5.5V) versions.

2. Features

◆ Low-voltage and Standard-voltage Operation

– 2.7 (VCC = 2.7V to 5.5V)

– 1.8 (VCC = 1.8V to 5.5V)

◆ Internally Organized, 256 x 8 (2K),

◆ 2-wire Serial Interface

◆ Schmitt Trigger, Filtered Inputs for Noise Suppression

◆ Bi-directional Data Transfer Protocol

◆ 100 kHz (1.8V) and 400 kHz (2.5V, 2.7V, 5V) Compatibility

◆ Write Protect Pin for Hardware Data Protection

◆ 8-byte Page (1K, 2K), Write Modes

◆ Partial Page Writes are Allowed

◆ Self-timed Write Cycle (5 ms max)

◆ High-reliability

◆ – Endurance: 1 Million Write Cycles

◆ – Data Retention: 100 Years

◆ Automotive Grade, Extended Temperature and Lead-Free Devices Available

◆ 8-lead PDIP, 8-lead JEDEC SOIC, 8-lead MAP, 5-lead SOT23,

◆ 8-lead TSSOP and 8-ball dBGA2™ Packages

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	A0	I	To Ground
2	A1	I	To Ground
3	A2	I	To Ground
4	VSS	I	To Ground
5	SDA	I/O	Serial Data input

6	SCL	I/O	Serial SCL input
7	TEST	I/O	Test port
8	VDD	I	Positive Power Supply

3.5.3 function introduction to 74HCU04

1. Description

The 74HCU04(U205) is a high-speed Si-gate CMOS device and is pin compatible with low power Schottky TTL (LSTTL). It is specified in compliance with JEDEC standard no. 7A.

The 74HCU04 is a general purpose hex inverter. Each of the six inverters is a single stage

2. Features

- Output capability: standard
- ICC category: SSI

3. PIN CONFIGURATION

PIN NO.	SYMBOL	I/O	Description
1, 3, 5, 9, 11, 13	1A to 6A	I	data inputs
2, 4, 6, 8, 10, 12	1Y to 6Y	O	data outputs
7	GND		ground (0 V)
14	VCC		positive supply voltage

3.5.4 function introduction to LM1117

1. Description

The LM1117(U209) series of adjustable and fixed voltage regulators are designed to provide 1A output current and to operate down to 1V input-to-output differential. The dropout voltage of the device is guaranteed maximum 1.3V at maximum output current, decreasing at lower load currents.

On-chip trimming adjusts the reference voltage to within 1% accuray. Current limit is also trimmed, minimizing the stress under overload conditions on both the regulator and power source circuitry.

The BM1117 devices are pin compatible with other three-terminal SCSI regulators and are offered in the low profile surface mount SOT-223 package and in the TO-252 (DPAK) plastic package.

2. Features

Three Terminal Adjustable or Fixed Voltages 1.5V, 1.8V, 2.5V, 2.85V, 3.3V and 5.0V

Output Current of 1A

Operates Down to 1V Dropout

Line Regulation: 0.2% Max.

Load Regulation: 0.4% Max.

SOT-223 and TO-252 package available

3.PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	GND/adjust	I	Ground (fixed)/adjust (adjustable)
2	Vout	O	Voltage output
3	Vin	I	Voltage input

3.5.5 Function introduction to 29LV160BE

29LV160BE (U214) is a 16Mbit FLASH memorizer, and the damage of U214 may cause troubles, such as power not on, no disc reading and power on picture mosaic. Pin function is shown as the following table:

Pin	Name	Function	Voltage (when no disc)	Data direction
1-9、16-25、48	AO-A19	20 bit address bus		I
11	WE	Write enable signal, low level is effective	3.23V	I
12	RESET	Reset, low level is effective	3.23V	I
10、13、14	NC	Blank pin		
15	RY/BY	Ready/system busy	3.23V	O
26	CE	Chip enable, low level effective	0V	I
27、46	VSS	Ground		
28	OE	Output enable signal , low level is effective	0V	I
29-3、6、38-44	DQ0-DQ14	15 bit data bus		O
37	VCC	5V power supply	+5V	
45	DQ15/A-1	Take word extend mode as data line, and bit extend mode as address line		I/O
47	BYTE	Select 8-bit or 16-bit output mode. High level is 16-bit output and low level is 8-bit output		I

3.5.6 Function introduction to HY57V641620HGT-7

64M 16-bit memorizer SDRAM (U211) with the player and the working clock frequency is 166/143MHZ. The function of 16SDRAM in DVD players is to memorizer the program of AML3298 taken out from FLASH and information of image and sound taken out from disc to form buffer, add the stability of information output and add anti-shaking effect of player. Pin function introduction is shown as the following table:

Pin	Name	Function	Signal flow	Pin	Name	Function	Signal flow
1	VDD	3.3V power supply		28	VSS	Ground	
2	DQ0	Data bus	I/O	29	MA4	Address bus	I
3	VDDQ	3.3V power supply	I/O	30	MA5	Address bus	I
4	DQ1	Data bus	I/O	31	MA6	Address bus	I
5	DQ2	Data bus	I/O	32	MA7	Address bus	I
6	VSSQ	Ground		33	MA8	Address bus	I
7	DQ3	Data bus	I/O	34	MA9	Address bus	I
8	DQ4	Data bus	I/O	35	MA11	Address bus	I
9	VDDQ	3.3V power supply		36	NC	Blank	
10	DQ5	Data bus	I/O	37	CKE	Clock enable signal	I
11	DQ6	Data bus	I/O	38	CLK	System clock input	I
12	VSSQ	Ground		39	UDQM	Data input/output screen-shielded signal	I
13	DQ7	Data bus	I/O	40	NC	Blank	
14	VDD	3.3V power supply		41	VSS	Ground	
15	LDQM	Data input/output screen-shielded signal	I	42	DQ8	Data bus	I/O
16	WE	Write control signal	I	43	VDDQ	3.3V power supply	
17	CAS	Line address gating signal	I	44	DQ9	Data bus	I/O
18	RAS	Row address gating signal	I	45	DQ10	Data bus	I/O
19	CS	Chip selection signal	I	46	VSSQ	Ground	
20	SD-BS0	Segmanr address 0 gating signal	I	47	DQ11	Data bus	I/O
21	SD-BS1	Segmanr address 1 gating signal	I	48	DQ12	Data bus	I/O
22	MA10	Address bus	I	49	VDDQ	3.3V power supply	
23	MA0	Address bus	I	50	DQ13	Data bus	I/O
24	MA1	Address bus	I	51	DQ14	Data bus	I/O

25	MA2	Address bus	I	52	VSSQ	Ground	
26	MA3	Address bus	I	53	DQ15	Data bus	I/O
27	VDD	3.3V power supply		54	VSS	Ground	

3.5.7 Function introduction to D5954

1. DESCRIPTION

D5954 (U302) is a servo drive IC with built-in 4-channel drive circuit. Digital focus, trace, feed and mainaxis drive signal outputted by MT1389E is sent to D5954 for amplifying through RC integration circuit. The focus, trace, feed and main axis drive signal being amplified by D5954 is sent to loader to fulfil the corresponding servo work.

2. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	VINFC	I	Focus control signal input
2	CF1	I	External feedback loop
3	CF2	I	External feedback loop
4	VINSL+	I	Forward control input, connected to reference voltage
5	VINSL-	I	Main axis control signal input
6	VOSL	O	External feedback resistor
7	VINFFC	I	Focus feedback signal input
8	VCC	I	5V power supply
9	PVCC1	I	5V power supply
10	PGND	I	Ground
11	VOSL-	O	Main axis drive reverse voltage output
12	VO2+	O	Main axis drive forward direction voltage output
13	VOFC-	O	Focus drive reverse voltage output
14	VOSC+	O	Focus drive forward voltage output
15	VOTK+	O	Trace drive forward direction voltage output
16	VOTK-	O	Trace drive reverse voltage output
17	VOLD+	O	Feed drive forward direction voltage output
18	VOLD-	O	Feed drive reverse voltage output
19	PGND	I	Ground
20	VINFTK	I	Trace feedback signal input
21	PVCC2	I	5V power supply

22	PREGND	I	Ground
23	VINLD	I	Feed control signal input
24	CTK2	I	External feedback loop
25	CTK1	I	External feedback loop
26	VINTK	I	Trace control signal input
27	BIAS	I	1.4V reference voltage input
28	STBY	I	Enable control signal

3.5.8 function introduction to 4558

1. Description

The RC4558 and RM4558 devices (N1) are dual general-purpose operational amplifiers with each half electrically similar to the ? A741 except that offset null capability is not provided.

The high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage-follower applications. The devices are short-circuit protected and the internal frequency compensation ensures stability without external components.

The RC4558 is characterized for operation from 0? C to 70? C, and the RM4558 is characterized for operation over the full military temperature range of –55 C to 125 C.

2. FEATURES

- Continuous-Short-Circuit Protection
- Wide Common-Mode and Differential
- Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Unity-Gain Bandwidth . . . 3 MHz Typ
- Gain and Phase Match Between Amplifiers
- Low Noise . . . 8 nV?Hz Typ at 1 kHz
- Designed To Be Interchangeable With
- Raytheon RC4558 and RM4558 Devices

3. PIN CONFIGURATION

PIN No	Symbol	I/O	Description
1	1OUT	O	Output 1
2	1IN–	I	Inverting Input Pin 1

3	1IN+	I	Non-Inverting Input Pin 1
4	VCC–	I	Negative Power Supply
5	2IN+	I	Non-Inverting Input Pin 2
6	2IN–	I	Inverting Input Pin 2
7	2OUT	O	Output 2

3.5.9 function introduction to SN74LVC

1. Description

The SN74LVC16373A (N2) is particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The device can be used as two 8-bit latches or one 16-bit latch. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the levels set up at the D inputs.

2. FEATURES

- ◆ Operates From 1.65 V to 3.6 V
- ◆ Inputs Accept Voltages to 5.5 V
- ◆ Max t_{pd} of 4.2 ns at 3.3 V
- ◆ Typical V_{OLP} (Output Ground Bounce)

<0.8 V at V_{CC} = 3.3 V, T_A = 25 ° C

- ◆ Typical V_{OHV} (Output V_{OH} Undershoot)

>2 V at V_{CC} = 3.3 V, T_A = 25 ° C

- ◆ I_{off} Supports Partial-Power-Down Mode Operation
- ◆ Supports Mixed-Mode Signal Operation

(5-V Input and Output Voltages With 3.3-V V_{CC})

- ◆ Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ◆ ESD Protection Exceeds JESD 22
- ◆ 2000-V Human-Body Model (A114-A)
- ◆ 1000-V Charged-Device Model (C101)

3.5.10 function introduction to 74HCT125

1. Description

The Harris CD74HC125 and CD74HCT125 contain 4 independent three-state buffers, each having its own output enable input, which when “HIGH” puts the output in the high impedance state.

2. FEATURES

- Three-State Outputs
- Separate Output Enable Inputs
- Fanout (Over Temperature Range)

  Standard Outputs : 10 LSTTL Loads

  Bus Driver Outputs: 15 LSTTL Loads
- Wide Operating Temperature Range . . . -55oC to 125oC
- Balanced Propagation Delay and Transition Times
- Significant Power Reduction Compared to LSTTL Logic ICs
- HC Types

  2V to 6V Operation

  High Noise Immunity: NIL = 30%, NIH = 30% of VCC at VCC = 5V
- HCT Types

  4.5V to 5.5V Operation

  Direct LSTTL Input Logic Compatibility, VIL= 0.8V (Max), VIH = 2V (Min)

  CMOS Input Compatibility, Il £ 1mA at VOL, VOH

3.5.11 function introduction to CD4052

1. Description

The CD4052B (N5) analog multiplexers is digitally-controlled analog switches having low ON impedance and very low OFF leakage current. Control of analog signals up to 20VP-P can be achieved by digital signal amplitudes of 4.5V to 20V (if VDD-VSS = 3V, a VDD-VEE of up to 13V can be controlled; for VDD-VEE level differences above 13V, a VDD-VSS of at least 4.5V is required). For example, if VDD = +4.5V, VSS = 0V, and VEE = -13.5V, analog signals from -13.5V to +4.5V can be controlled by digital inputs of 0V to 5V. These multiplexer circuits dissipate extremely low quiescent power over the full VDD-VSS and VDD-VEE supply-voltage ranges, independent of the logic state of the control signals. When a logic "1" is present at the inhibit input terminal, all channels are off.

The CD4052B is a differential 4-Channel multiplexer having two binary control inputs, A and B, and an inhibit input. The two binary input signals select 1 of 4 pairs of channels to be turned on and connect the analog inputs to the outputs.

2. FEATURES

- Wide Range of Digital and Analog Signal Levels

  Digital : 3V to 20V

  Analog: ≤20VP-P
- Low ON Resistance, 125W (Typ) Over 15VP-P Signal Input Range for V_{DD}-V_{EE} = 18V

- High OFF Resistance, Channel Leakage of ± 100pA (Typ) at V_{DD}-V_{EE} = 18V
- Logic-Level Conversion for Digital Addressing Signals of 3V to 20V (V_{DD}-V_{SS} = 3V to 20V) to Switch Analog Signals to 20VP-P (V_{DD}-V_{EE} = 20V)
- Matched Switch Characteristics, r_{ON} = 5W (Typ) for V_{DD}-V_{EE} = 15V
- Very Low Quiescent Power Dissipation Under All Digital-Control Input and Supply Conditions, 0.2mW (Typ) at V_{DD}-V_{SS} = V_{DD}-V_{EE} = 10V
- Binary Address Decoding on Chip
- 5V, 10V and 15V Parametric Ratings
- 10% Tested for Quiescent Current at 20V
- Maximum Input Current of 1mA at 18V Over Full Package Temperature Range, 100nA at 18V and 25 ℃
- Break-Before-Make Switching Eliminates Channel Overlap

3.5.12 function introduction to SAA6588

1. DESCRIPTION

Today most FM radio stations in Europe and meanwhile also many FM/AM radio broadcasting stations in the USA transmit the inaudible European RDS (Radio Data System) or the USA RBDS (Radio Broadcast Data System) informations respectively. Likewise nowadays receivers, most car radios and also some home and portable radios on the market include at least some of the RDS features.

The RDS/RBDS system offers a large range of applications by its many functions to be implemented. For car radios the most important are:

- Program Service (PS) name
- Traffic Program (TP) identification
- Traffic Announcement (TA) signal
- Alternative Frequency (AF) list
- Program Identification (PI)
- Enhanced Other Networks (EON) information.

The RDS/RBDS pre-processor is a CMOS device that integrates all RDS/RBDS relevant functions in one chip. The IC contains filtering and demodulation of the RDS/RBDS signal, symbol decoding, block synchronization, error detection, error correction and additional detectors for multi-path, signal quality and audio signal pauses. The pre-processed RDS/RBDS information is available via the I2C-bus.

The RDS/RBDS pre-processor replaces a number of Ics and peripheral components used nowadays in car radio concepts with RDS or RBDS features. The integration of the relevant RDS/RBDS data processing functions provides, in an economic manner, high performance of RDS/RBDS processing and reduces the real-time requirements for the main radio microcontroller considerably. In addition it simplifies the development of the RDS specific software for the main controller of the radio set.

Compared with standard radio systems, RDS/RBDS controlled radio systems additionally require an RDS/RBDS demodulator with a 57 kHz band-pass filter, information about the current reception situation (reception quality, multi-path disturbance etc.), and additional microcontroller power for RDS/RBDS data processing, decoding and radio control.

The new RDS/RBDS pre-processor includes all these specific functions and meets all requirements of a high end RDS/RBDS radio. Moreover the timing requirements of the set controller, regarding RDS/RBDS data processing are reduced due to the integration of decoder functions, so that the development of radio control software can be concentrated specifically on radio set features.

2. FEATURES

- Integrated switched capacitor filters
- Demodulation of the European Radio Data System (RDS) or the USA Radio Broadcast Data System (RBDS) signal
- RDS and RBDS block detection
- Error detection and correction
- Fast block synchronization
- Synchronization control (flywheel)
- Mode control for RDS/RBDS processing
- Different RDS/RBDS block information output modes (e.g. A-block output mode)
- Fast I2C-bus interface
- Multi-path detector
- Signal quality detector with sensitivity adjustment
- Pause detector with pause level and time adjustment
- Alternatively oscillator frequency: n ´ 4.332 MHz (n = 1 to 4)
- UART compatible with 17.328 MHz (n = 4)
- CMOS device
- Single supply voltage
- Extended temperature range (-40 to +85 °C).

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	MRO	O	multi-path rectifier output
2	MPTH	O	multi-path detector output
3	TCON	I	test control input pin
4	OSCO	O	oscillator output
5	OSCI	I	oscillator input

6	VSSD	I	digital ground (0 V)
7	VDDD	I	digital supply voltage (5 V)
8	DAVN	O	data available output (active LOW)
9	SDA	I/O	I2C-bus serial data I/O
10	SCL	I	I2C-bus serial clock input
11	PSWN	O	pause switch output (active LOW)
12	MAD	I	slave address (LSB) input
13	AFIN	I	audio signal input
14	VDDA	I	analog supply voltage (5 V)
15	VSSA	I	analog ground (0 V)
16	MPX	I	multiplex input signal
17	Vref	O	reference voltage output
18	SCOUT	O	band-pass filter output
19	CIN	I	comparator input
20	LVIN	I	level input

3.5.13 function introduction to 5340

1. DESCRIPTION

The CS5340 (N7) is complete analog-to-digital converter for digital audio systems. It performs sampling, analog-to-digital conversion and anti-alias littering, generating 24-bit values for both left and right inputs in serial form at sample rates up to 200 kHz per channel.

The CS5340 uses a 5th-order,multi-bit delta-sigma modulator followed by digital filtering and decimation, which removes the need for an external anti-alias filter.

The CS5340 is ideal for audio systems requiring wide dynamic range, negligible distortion and low noise, such as set-top boxes, DVD-karaoke players, DVD recorders, A/V receivers, and automotive applications.

2. FEATURES

- Advanced multi-bit Delta-Sigma architecture
- 24-bit conversion.
- Supports all audio sample rates including 192kHz.
- 101dB Dynamic Range at 5V.
- -94 dB THD+N.
- High pass filter to remove DC offsets.
- Analog/digital core supplies from 3.3V to 5V..

- Linear phase digital anti-alias filtering.
- Auto-mode selection.

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	M0	I	Mode selection 0
2	MCLK	I	Master clock
3	VL	I	Logic power
4	SDOUT	O	Serial audio data output
5	GND	I	GND
6	VD	I	Digital power
7	SCLK	I	Serial clock
8	LRCK	I	Left right clock
9	/RST	I	Reset
10	AINL	I	Analog input L
11	VQ	O	Quiescent voltage
12	AINR	I	Analog input R
13	VA	I	Analog power
14	REF_GND	I	GND
15	FILT+	I	Positive voltage reference
16	M1	I	Mode selection 1

3.5.14 function introduction to TLV272

1. DESCRIPTION

The TLV27x (N8, N9) takes the minimum operating supply voltage down to 2.7 V over the extended industrial temperature range while adding the rail-to-rail output swing feature. This makes it an ideal alternative to the TLC27x family for applications where rail-to-rail output swings are essential. The TLV27x also provides 3-MHz bandwidth from only 550μA.

Like the TLC27x, the TLV27x is fully specified for 5-V and ±5-V supplies. The maximum recommended supply voltage is 16 V, which allows the devices to be operated from a variety of rechargeable cells (±8 V supplies down to ±1.35 V).

The CMOS inputs enable use in high-impedance sensor interfaces, with the lower voltage operation making an attractive alternative for the TLC27x in battery-powered applications.

All members are available in PDIP and SOIC with the singles in the small SOT-23 package, duals in the

MSOP, and quads in the TSSOP package.

The 2.7-V operation makes it compatible with Li-Ion powered systems and the operating supply voltage range of many micro power microcontrollers available today including TI's MSP430.

2. FEATURES

- Rail-To-Rail Output
- Wide Bandwidth . . . 3 MHz
- High Slew Rate . . . 2 .4 V/µs
- Supply Voltage Range . . . 2.7 V to 16 V
- Supply Current . . . 550 µA/Channel
- Input Noise Voltage . . . 39 nV/vHz
- Input Bias Current . . . 1 pA
- Specified Temperature Range
  0 °C to 70 °C . . . Commercial Grade
  -40 °C to 125 °C . . . Industrial Grade
- Ultrasmall Packaging
  8 Pin MSOP (TLV272)

3.5.15 function introduction to LM4880

1. DESCRIPTION

The LM4880 (N11) is a dual audio power amplifier capable of delivering typically 250mW per channel of continuous average power to an 8O load with 0.1% THD+N using a 5V power supply.

Boomer audio power amplifiers were designed specifically to provide high quality output power with a minimal amount of external components using surface mount packaging. Since the LM4880 does not require bootstrap capacitors or snubber networks, it is optimally suited for low-power portable systems.

The LM4880 features an externally controlled, low-power consumption shutdown mode, as well as an internal thermal shutdown protection mechanism.

The unity-gain stable LM4880 can be configured by external gain-setting resistors.

2. FEATURES

- No bootstrap capacitors or snubber circuits are necessary
- Small Outline (SO) and DIP packaging
- Unity-gain stable
- External gain configuration capability

3.5.16 function introduction to TAS5508PAG

1. DESCRIPTION

The TAS5508 (N12) is an eight channel digital pulse width modulator (PWM) that provides both advanced performance and a high level of system integration. The TAS5508 is designed to interface seamlessly with most audio digital signal processors. In crystal mode, the TAS5508 automatically adjusts control configurations in response to clock and data rate changes and idle conditions. This enables the TAS5508 to provide an easy to use control interface with relaxed timing requirements.

The TAS5508 can drive eight channels of H-bridge power stages. Texas Instruments H-bridge parts TAS5111, TAS5112, or TAS5182 + FETs are designed to work seamlessly with the TAS5508. The TAS5508 supports both single-ended or bridge tied load configurations. The TAS5508 also provides a high performance differential output to drive an external differential input analog headphone amplifier (such as the TPA112).

The TAS5508's uses an AD modulation operating at a 384-kHz switching rate for 48-, 96-, and 192-kHz data. The 8x over sampling combined with the 5th order noise shaper provides a broad flat noise floor and excellent dynamic range from 20 Hz to 20 kHz.

The TAS5508 is clock slave only device. The TAS5508 receives MCLK, SCLK and LRCLK from other system components. The TAS5508 accepts master clock rates of 64, 128, 192, 256, 384, 512, and 768 Fs. The TAS5508 accepts a 64-Fs bit clock.

The TAS5508 allows for extending the dynamic range by providing a power supply volume control (PSVC) output signal.

2. FEATURES

- Automated Operation With an Easy to Use Control Interface
- I^2C Serial Control Slave Interface
- Integrated AM Interference Avoidance Circuitry
- Single 3.3-V Power Supply
- 64-Pin TQFP Package
- 5-V Tolerant Inputs
- Supports Two PLL Input Modes:
- Crystal Mode
- No-Crystal Mode

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	VRA_PLL		Voltage reference for PLL analog supply 1.8 V
2	PLL_FLT_RET	AO	PLL external filter return

3	PLL_FLTM	AO	PLL negative input
4	PLL_FLTP	AI	PLL positive input
5	AVSS	P	Analog ground
6	AVSS	P	Analog ground
7	VRD_PLL	P	Voltage reference for PLL digital supply 1.8 V
8	AVSS_PLL	P	Analog ground for PLL
9	AVDD_PLL	P	3.3-V analog power supply for PLL
10	VBGAP	P	Band gap voltage reference
11	RESET	DI	System reset input
12	HP_SEL	DI	Headphone in/out
13	PDN	DI	Power down
14	MUTE	DI	Soft mute of outputs
15	DVDD	P	Digital power 3.3-V supply for digital core
16	DVSS	P	Digital ground for digital core
17	VR_DPLL	P	Voltage reference for digital PLL supply 1.8 V
18	OSC_CAP	AO	Oscillator capacitor in crystal mode
19	XTL_OUT	AO	1.8-V output drive to the crystal
20	XTL_IN	AI	1.8-V input port for the oscillator circuit
21	RESERVED		Connect to digital ground
22	TBASE_SEL		Connect to digital ground in crystal mode
23	RESERVED		Connect to digital ground
24	SDA	DIO	I2C serial control data interface input / output
25	SCL	DI	I2C serial control clock input output
26	LRCLK	DI	Serial audio data left / right clock
27	SCLK	DI	Serial audio data clock
28	SDIN4	DI	Serial audio data 4 input
29	SDIN3	DI	Serial audio data 3 input
30	SDIN2	DI	Serial audio data 2 input
31	SDIN1	DI	Serial audio data 1 input
32	PSVC	O	Power supply volume control PWM output
33	VR_DIG	P	Voltage reference for digital core supply 1.8 V
34	DVSS	P	Digital ground
35	DVSS	P	Digital ground

36	DVDD	P	3.3-V digital power supply
37	/BKND_ERR	DI	
38	DVSS	P	Digital ground
39	VALID	DO	Output indicating validity of PWM outputs
40	PWM_M_1	DO	PWM 1 output (differential -)
41	PWM_P_1	DO	PWM 1 output (differential +)
42	PWM_M_2	DO	PWM 2 output (differential -)
43	PWM_P_2	DO	PWM 2 output (differential +)
44	PWM_M_3	DO	PWM 3 output (differential -)
45	PWM_P_3	DO	PWM 3 output (differential +)
46	PWM_M_4	DO	PWM 4 output (differential -)
47	PWM_P_4	DO	PWM 4 output (differential +)
48	VR_PWM	P	Voltage reference for digital PWM core supply
49	PWM_M_7	DO	PWM 7 (Line out L) output (differential -)
50	PWM_P_7	DO	PWM 7 (Line out L) output (differential +)
51	PWM_M_8	DO	PWM 8 (Line out R) output (differential -)
52	PWM_P_8	DO	PWM 8 (Line out R) output (differential +)
53	DVSS_PWM	P	Digital ground for PWM
54	DVDD_PWM	P	3.3-V digital power supply for PWM
55	PWM_M_5	DO	PWM 5 output (differential -)
56	PWM_P_5	DO	PWM 5 output (differential +)
57	PWM_M_6	DO	PWM 6 output differential -)
58	PWM_P_6	DO	PWM 6 output (differential +)
59	PWM_HPML	DO	PWM left channel headphone (differential -)
60	PWM_HPPL	DO	PWM left channel headphone (differential +)
61	PWM_HPMR	DO	PWM right channel headphone (differential -)
62	PWM_HPPR	DO	PWM right channel headphone (differential +)
63	MCLK	DI	MCLK is a 3.3-V clock master clock input
64	RESERVED		Connect to digital ground

3.5.17 function introduction to TAS5112DFD

1. DESCRIPTION

The TAS5112 (N13, N14) is a high-performance, integrated stereo Digital Amplifier Power Stage

designed to drive 6_ speakers at up to 50W per channel. The device incorporates TI's equibit™ technology and is used in conjunction with a Digital Audio PWM processor (TAS50XX) and a simple passive demodulation filter to deliver high-quality, high efficiency True Digital Audio Amplification.

The efficiency of this digital amplifier is typically 88%, reducing the size of both the power supplies and heat sinks needed. Heat sink should have thermal resistance of at least 3.5 C/W and mass of 140 grams. When running both channels full power continuously, adequate thermal design is required. Over-Current Protection, Over-Temperature Protection and Under-Voltage Protection are built into the TAS5112, safeguarding the device and speakers against fault conditions that could damage the system.

2. FEATURES

- 2x50W (BTL) into 6O
- 95 dB SNR (TDAA system with TAS5026)
- < 0.06% THD+N (TDAA system - 1W RMS into 6O)
- < 0.2% THD+N (TDAA system - 50W RMS into 6O)
- Power efficiency typical 88% @ 6Oload
- Self-protection design (including under voltage, over temperature and short condition) with error reports
- 56-pin DFD PowerPad™ package
- 3.3 V Digital Interface
- Internal Gate Drive Supply voltage Regulator
- EMI compliant when used with recommended system design
- Four matched DMOS power transistors

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
28	GND		Power ground
27	GND	P	Power ground
26	GREG	P	Gate drive voltage regulator decoupling pin
25	DVDD	P	I/O refernece supply input (3.3V)
24	GND		Power ground
23	DGND	P	Digital I/O reference ground
22	GND		I/O reference ground
21	PWM AP	I	Input signal (positive), Half-bridge A
20	PWM AM	I	Input signal (negative), Half-bridge A
19	/RESET AB	I	Reset signal, active low

18	PWM BM	I	Input signal (negative), Half-bridge B
17	PWM BP	I	Input signal (positive), Half-bridge B
16	DREG	P	Digital supply voltage regulator decoupling pin
15	M1	I	Mode selection pin
14	M2	I	Mode selection pin
13	M3	I	Mode selection pin
12	DREG RTN	P	Digital supply voltage regulator decoupling return pin
11	PWM CP	I	Input signal (positive), Half-bridge C
10	PWM CM	I	Input signal (negative), Half-bridge C
9	/RESET CD	I	Reset signal, active low
8	PWM DM	I	Input signal (negative), Half-bridge D
7	PWM DP	I	Input signal (positive), Half-bridge D
6	/SD AB	O	Shutdown signal for half-bridge A and B
5	/SD CD	O	Shutdown signal for half-bridge C and D
4	/OTW	O	Over temperature warning output
3	GREG	P	Gate drive voltage regulator decoupling pin
2	GND	P	Power ground
1	GND		Power ground
56	GND		Power ground
55	GVDD	P	Voltage supply
54	BST D	P	HS bootstrap supply (BST)
53	PVDD D	P	Power supply input for half-bridge D
52	PVDD D	P	Power supply input for half-bridge D
51	OUT D	O	Output, half-bridge D
50	OUT D	O	Output, half-bridge D
49	GND	P	Power ground
48	GND	P	Power ground
47	OUT C	O	Output, half-bridge C
46	OUT C	O	Output, half-bridge C
45	PVDD C	P	Power supply input for half-bridge C
44	PVDD C	P	Power supply input for half-bridge C
43	BST C	P	HS bootstrap supply (BST)
42	BST B	P	HS bootstrap supply (BST)

41	PVDD B	P	Power supply input for half-bridge B
40	PVDD B	P	Power supply input for half-bridge B
39	OUT B	O	Output, half-bridge B
38	OUT B	O	Output, half-bridge B
37	GND	P	Power ground
36	GND	P	Power ground
35	OUT A	O	Output, half-bridge A
34	OUT A	O	Output, half-bridge A
33	PVDD A	P	Power supply input for half-bridge A
32	PVDD A	P	Power supply input for half-bridge A
31	BST A	P	HS bootstrap supply (BST)
30	GVDD	P	Voltage supply
29	GND		Power ground

3.5.18 Function introduction to AD7312

1. DESCRIPTION

The AD7312 (N101) is a VFD (Vacuum Fluorescent Display) controller/driver with STANDBY controller. It is driven on a 1/4 to 1/11 duty factor (include key scan). It consists of 5 segment output lines, 6 segment/key scan output lines, 6 grid output lines, 5 segment/grid output drive lines, 2 LED output ports, a display memory, a control circuit, and a key scan circuit. In addition, it includes 2 input ports, RMIN and SKEY, RMIN receives the signal form the STANDBY-KEY of remote sensor, SEKY can be controlled by an external switch. Both of them and STANBY SCAN-KEY can control the output level (High) of PSV port to realize the STANDBY function. To leave the standby mode, we can use the 2 remote WAKE_UP-KEY, 3 WAKE_UP SCAN-KEY, remote STANDBY-KEY, STANDBY-KEY and STANDBY SCAN-KEY to control the output level (Low) of PSV port to realize the Wake Up function. Serial data is input to the AD7312 through a four-line serial interface.

2. FEATURES

- Serial interface (CLK, STB, D_{IN}, D_{OUT})
- Key scanning (6✕4 matrices)
- Programming display modes (11-digit & 11-segment to 6-digit & 16-segment)
- Programming dimming step
- High-voltage output (V_{DD}-35V max).
- LED ports (2 channels., 20 mA max).
- 2-pin General-purpose input port

- Built-in oscillator
- No external resistor necessary for driver outputs (provides PMOS open-drain and pull-low resistor output)
- Remote signal input port
- Remote signal output port
- 3 STANDBY master output ports (controlled by remote STANDBY-KEY, STANDBY-KEY and STANDBY SCAN-KEY)
- 8 WAKE UP master output ports (controlled by 2 remote WAKE_UP-KEY, 3 WAKE_UP SCANKEY, remote STANDBY-KEY, STANDBY-KEY and STANDBY SCAN-KEY)
- NEC 6121/6122 infrared protocol support

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
6	DIN	I	Data input
5	DOUT	O	Data output
9	STB	O	Strobe
8	CLK	I	Clock input
44	OSC		Oscillator pin
21 to 25	Seg7 to Seg11	O	High-voltage output (Segment)
15 to 20	Seg1/KS1 to Seg6/KS6	O	High-voltage output
32 to 37	Grid1 to Grid6	O	High-voltage output (Grid)
26, 28 to 31	Seg12/Grid11 to Seg16/Grid7	O	High-voltage output (Segment/grid)
39 and 42	LED1 and LED4	O	LED output
40	RMBUF	I	Remote Control Buffer
41	PSV	O	Power Saving Output
10 to 13	KEY1 to KEY4	I	Key data input
14, 38	VDD	I	Logic power
7, 43	VSS	I	Logic ground
27	VEE	I	Pull-down level
1 and 4	SW1 and SW4	I	Switch input
2	RMIN	I	Remote Control Input
3	SKEY	I	Standby Key Input

3.5.19 function introduction to VIPer22ADIP

1. DESCRIPTION

The VIPer22A (U501) combines a dedicated current mode PWM controller with a high voltage Power MOSFET on the same silicon chip. Typical applications cover off line power supplies for battery charger adapters, standby power supplies for TV or monitors, auxiliary supplies for motor control, etc. The internal control circuit offers the following benefits:

Large input voltage range on the VDD pin accommodates changes in auxiliary supply voltage. This feature is well adapted to battery charger adapter configurations.

Automatic burst mode in low load condition.

Over voltage protection in hiccup mode.

2. FEATURES

- FIXED 60 KHZ SWITCHING FREQUENCY
- 9V TO 38V WIDE RANGE VDD VOLTAGE
- CURRENT MODE CONTROL
- AUXILIARY UNDERVOLTAGE LOCKOUT WITH HYSTERESIS
- HIGH VOLTAGE START UP CURRENT SOURCE
- OVERTEMPERATURE, OVERCURRENT AND OVERVOLTAGE PROTECTION WITH AUTORESTART

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	SOURCE	O	Power MOSFET source and circuit ground reference.
2	SOURCE	O	Power MOSFET source and circuit ground reference.
3	FB	I	Feedback input.
4	VDD	I	Power supply of the control circuits.
5	DRAIN	I	Power MOSFET drain.
6	DRAIN	I	Power MOSFET drain.
7	DRAIN	I	Power MOSFET drain.
8	DRAIN	I	Power MOSFET drain.

3.5.20 Function introduction to HS817

HS817 (U502, U506) is a photoelectric coupler, shown as the figure 3.5.20.1. The right side is a light emitting diode, which sends out light of different intensity according to the strength of voltage inputted from the right side, generates photocurrent of different intensity on the left side according to light of different intensity,

and outputs from position D. The higher of the voltage inputted from the right side, the stronger of the light emitted from light emitting diode and the larger of the photocurrent produced from position D. The lower of the voltage inputted from the right side of photoelectric coupler, the weaker of the light emitted from light emitting diode and the weaker of the current outputted from position D.

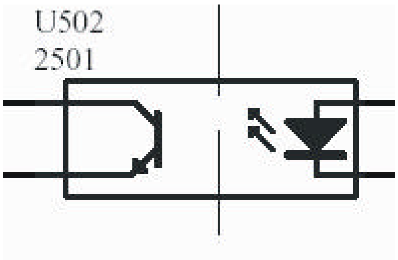


Figure 3.5.20.1 2501 outside drawing

3.5.21 Function introduction to TL431A

TL431A (U503, U507) is a 2.5V comparator, shown as the figure 3.5.21.1. Compared the inputted voltage of R end with 2.5V, when voltage of R end is more than 2.5V, KA end is on and photoelectric coupler starts to send out photocurrent; when voltage of R end is less than 2.5V, KA end is cutoff and photoelectric coupler does not send out photocurrent. CPU+3.3V in power board circuit must be kept in 3.3V, for the function of comparator. No matter more than or less than 3.3V, through on and off status of comparator, it will control the on state of the output end of photoelectric coupler LM431A to adjust the output space occupation ratio of switch module to control the output voltage of transformer and masthead the power.

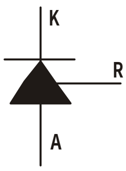


Figure 3.5.21.1 LM431A outside drawing

3.5.22 function introduction to KA1M0880BTU

1. DESCRIPTION

The Fairchild Power Switch(FPS) product family is specially designed for an off-line SMPS with minimal external components. The Fairchild Power Switch(FPS) consist of high voltage power SenseFET and current mode PWM IC. Included PWM controller features integrated fixed frequency oscillator, under voltage lock-out, leading edge blanking, optimized gate turn-on/turn-off driver, thermal shutdown protection, over voltage

protection, and temperature compensated precision current sources for loopcompensation and fault protection circuitry. Compared to discrete MOSFET and PWM controller or RCC solution, a Fairchild Power Switch(FPS) can reduce total component count, design size, weight and at the same time increase efficiency, productivity, and system reliability. It has a basic platform well suited for cost effective design in either a flyback converter or a forward converter.

2. FEATURES

- ◆ Precision fixed operating frequency (100/67/50kHz), KA1M0880BTU (70Hz)
- ◆ Low start-up current(typ. 100uA)
- ◆ Pulse by pulse current limiting
- ◆ Over current protection
- ◆ Over voltage protecton (Min. 25V), KA1M0880BTU (Min. 23V)
- ◆ Internal thermal shutdown function
- ◆ Under voltage lockout
- ◆ Internal high voltage sense FET
- ◆ Auto-restart mode

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	GND	I	ground
2	Drain	O	Voltage output
3	Vcc	I	Voltage input
4	FB	I	Feed back

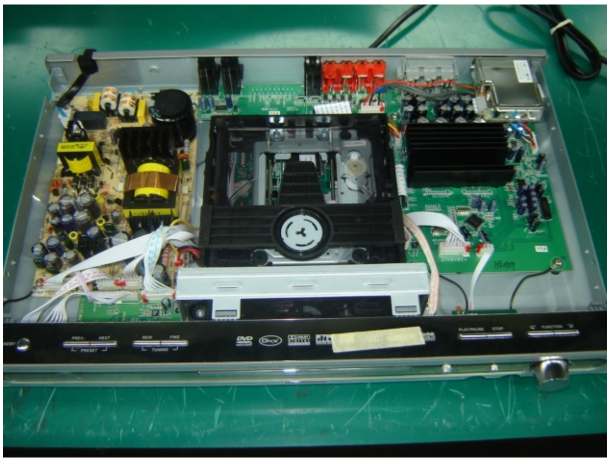
Chapter Four

Disassembly and Assembly Process

DVD players manufactured in BBK are largely identical but with minor differences and are mainly composed of loader components, control panel components, decode and servo board components, power board components, power amplifier board components, MIC board components and AV board components. In order to speed up the compilation of “Service Manual”, we shall not give repeat explanation to model with minor differences in chapter four “Disassembly and Assembly Process” for the later compiled service manuals. For disassembly and assembly process in this chapter, please refer to chapter 4 of “DK1005S Service Manual” or “DK1020S Service” .

The pictures of this model are shown as follows:



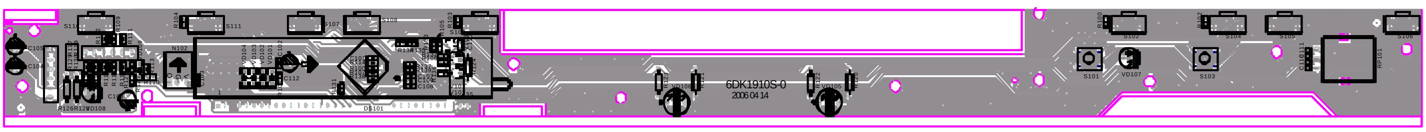


Chapter Cinque

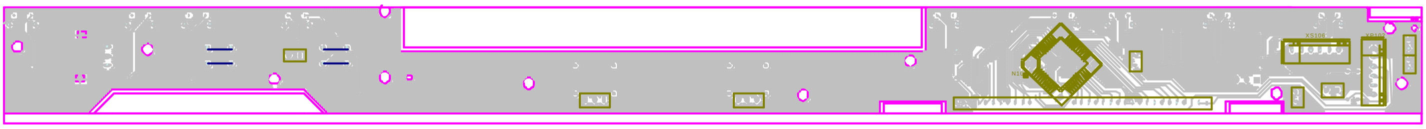
PCB board & Circuit diagram

Section One PCB board

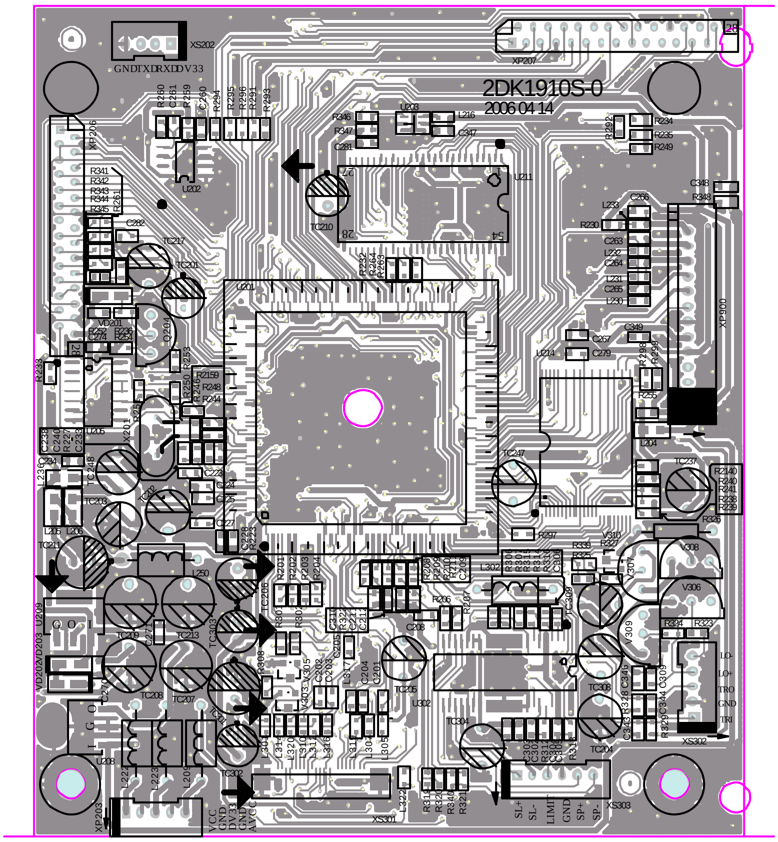
5.1.1 Surface layer of KEY SCAN Board



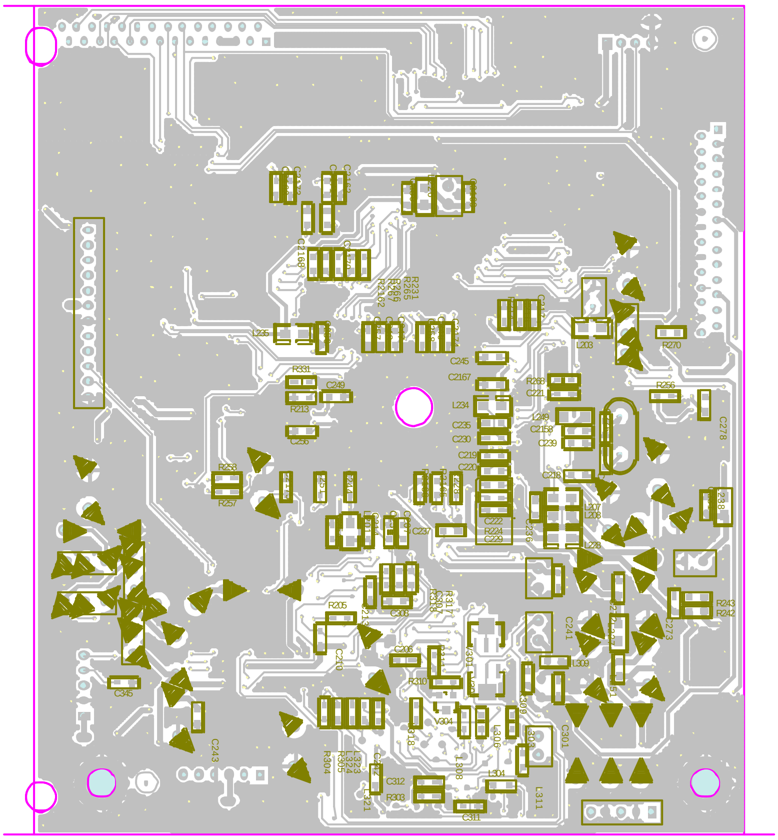
5.1.2 Bottom layer of KEY SCAN Board



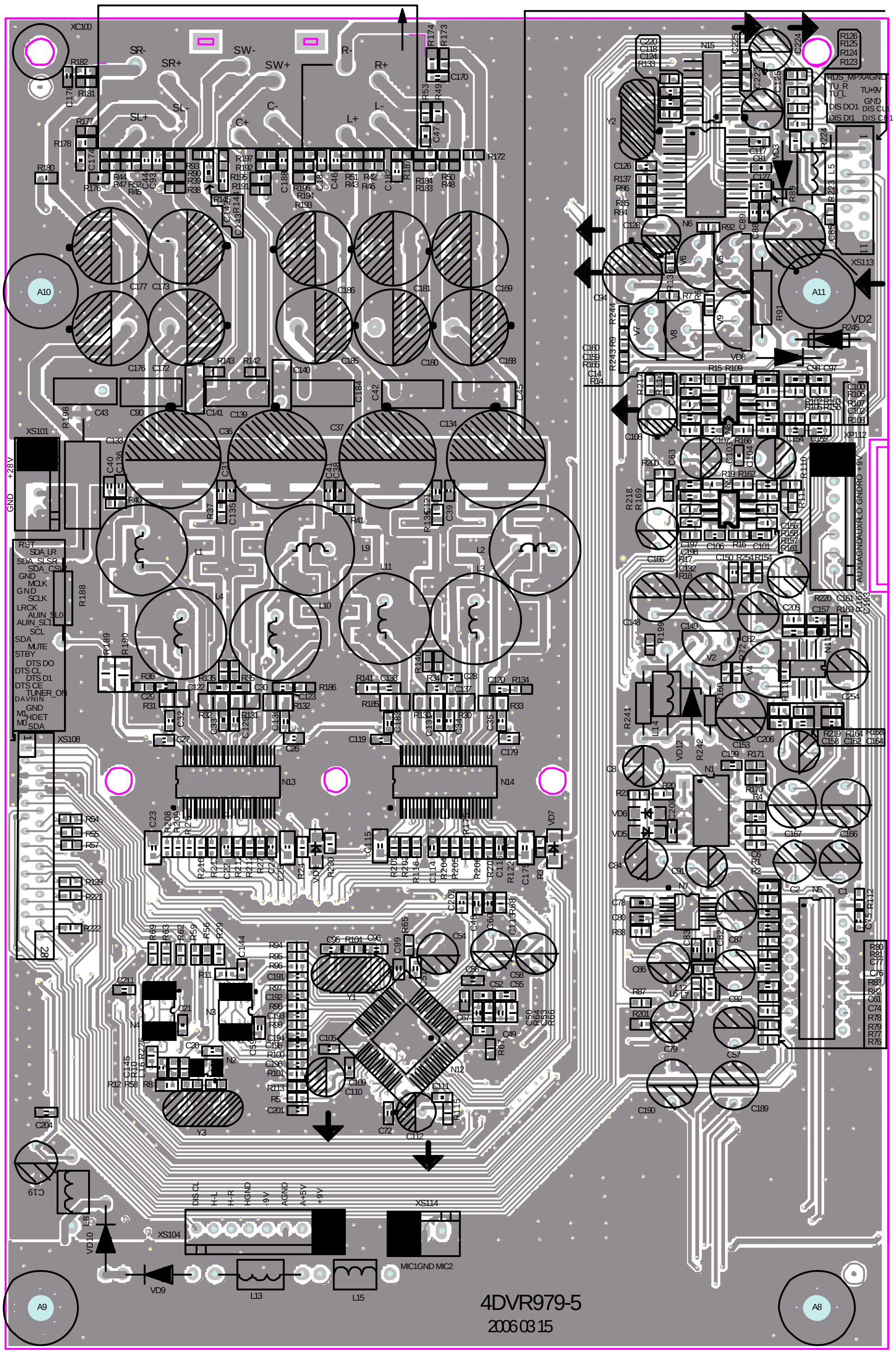
5.1.3 Surface layer of DECODE&SERVO Board



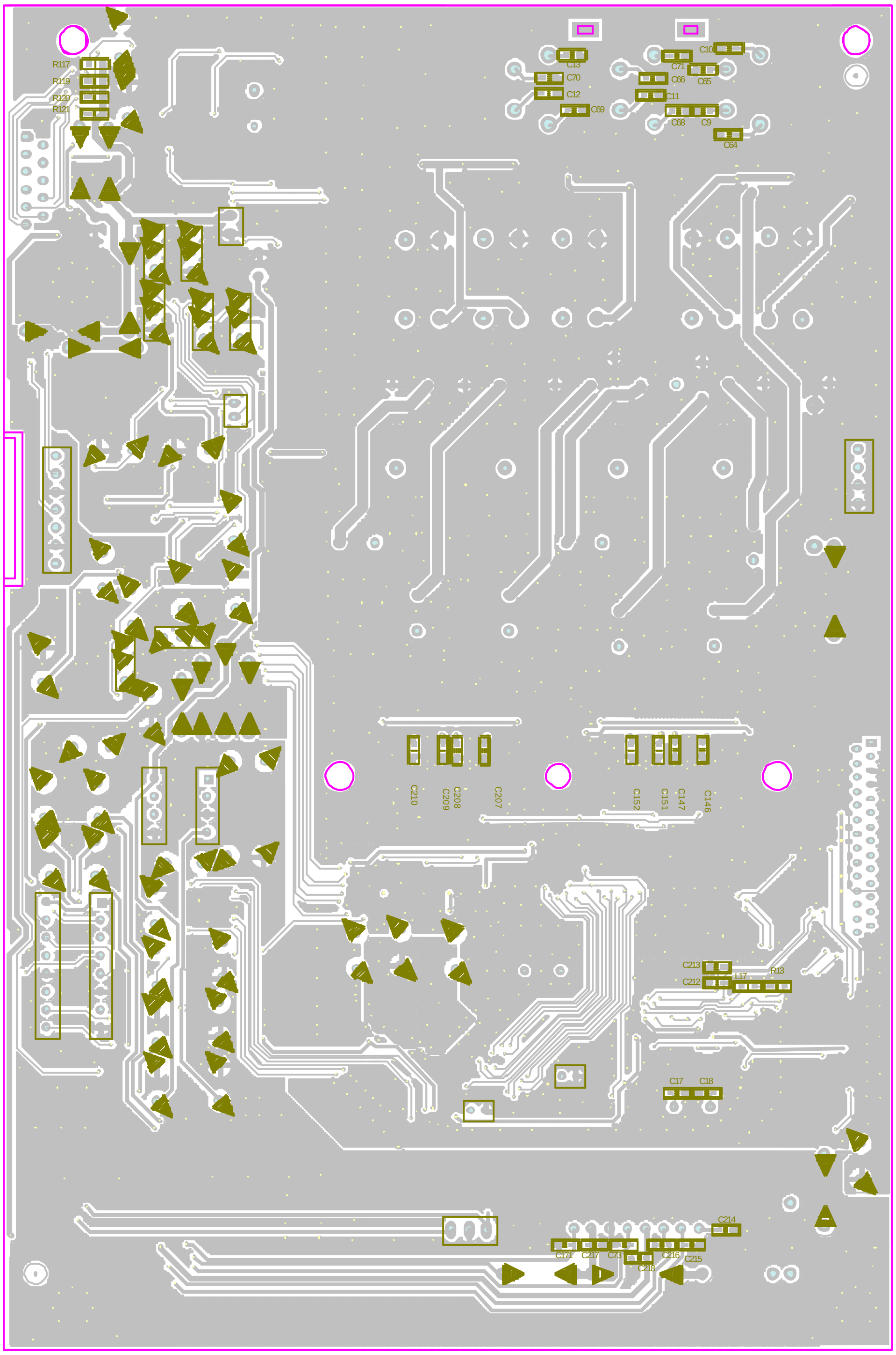
5.1.4 Bottom layer of DECODE&SERVO Board



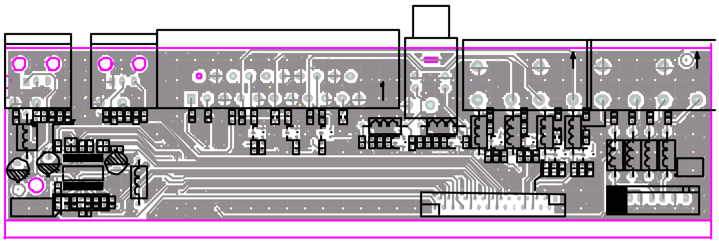
5.1.5 Surface layer of audio power amplifying Board



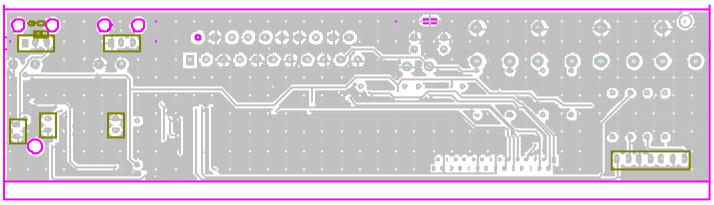
5.1.6 Bottom layer of audio power amplifying Board



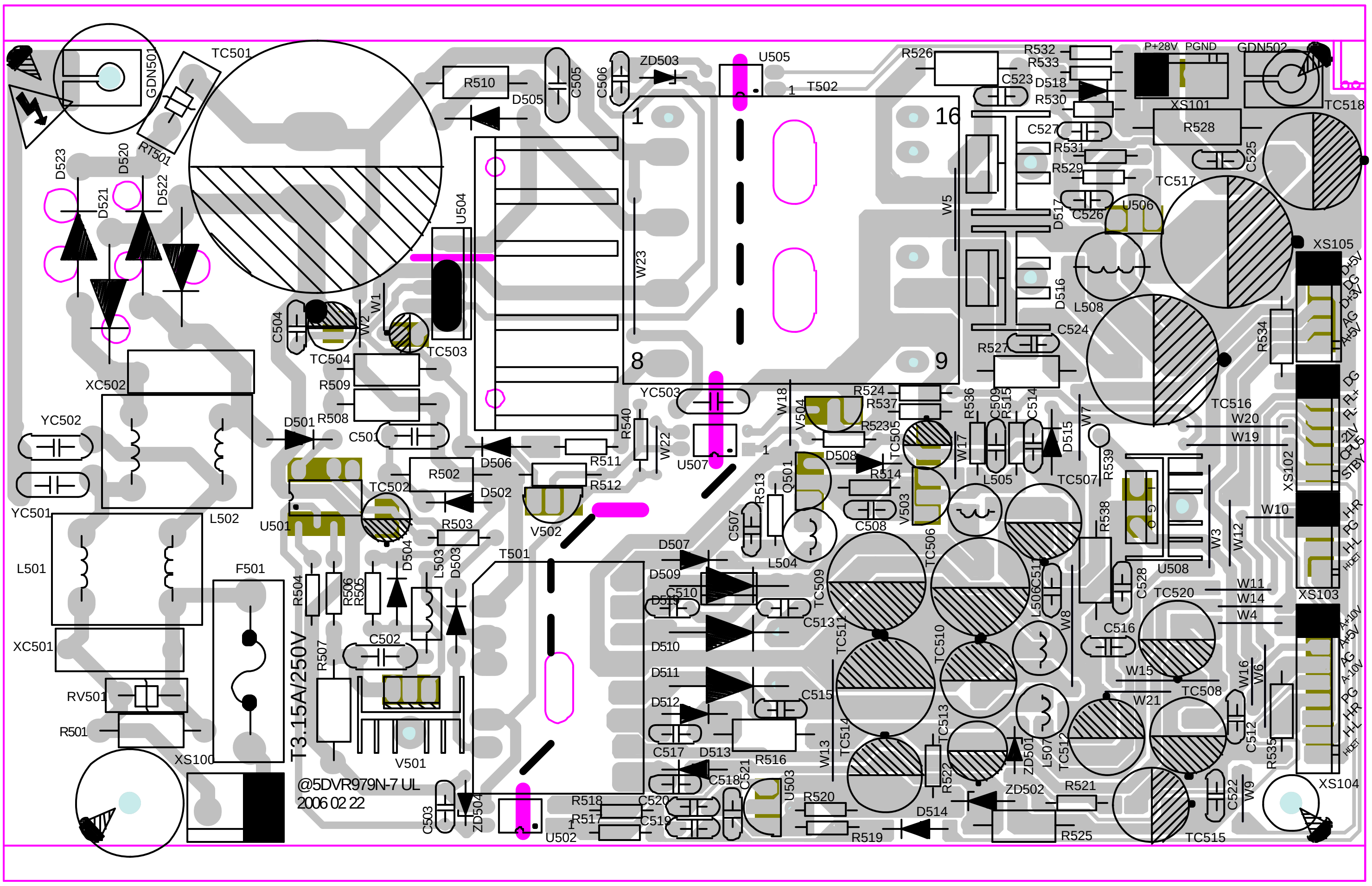
5.1.7 Surface layer of AV Board



5.1.8 Bottom layer of AV Board

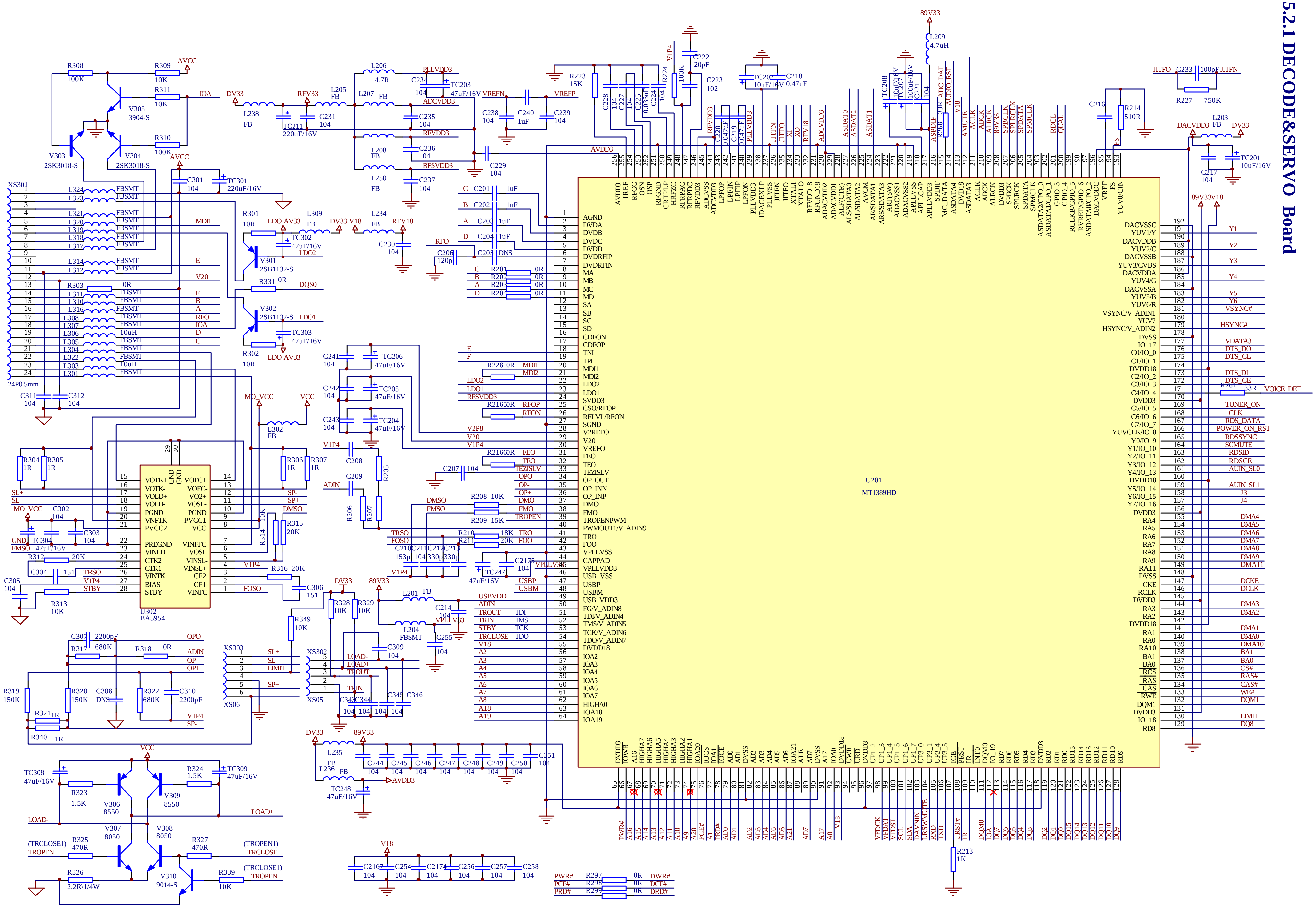


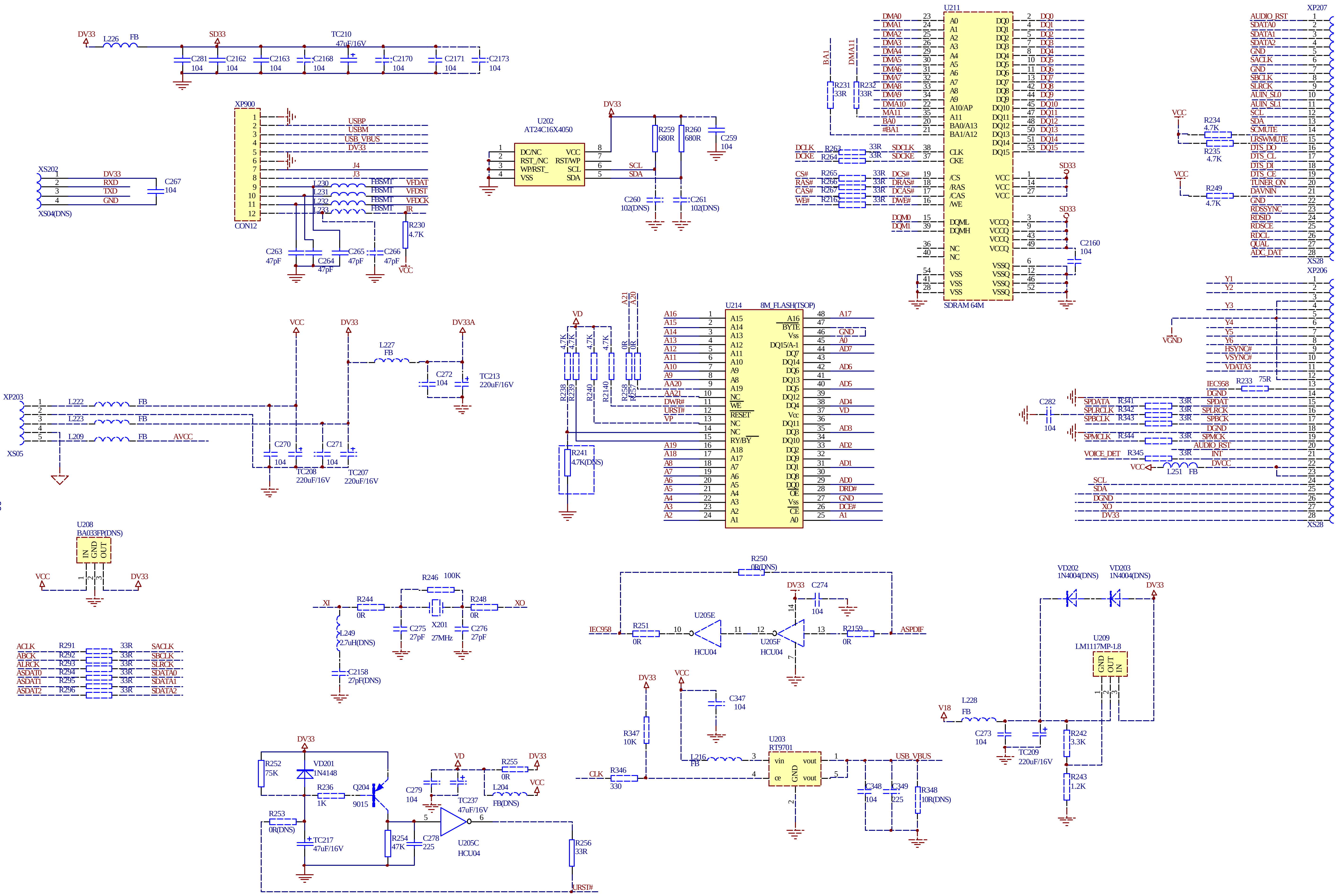
5.1.9 POWER Board



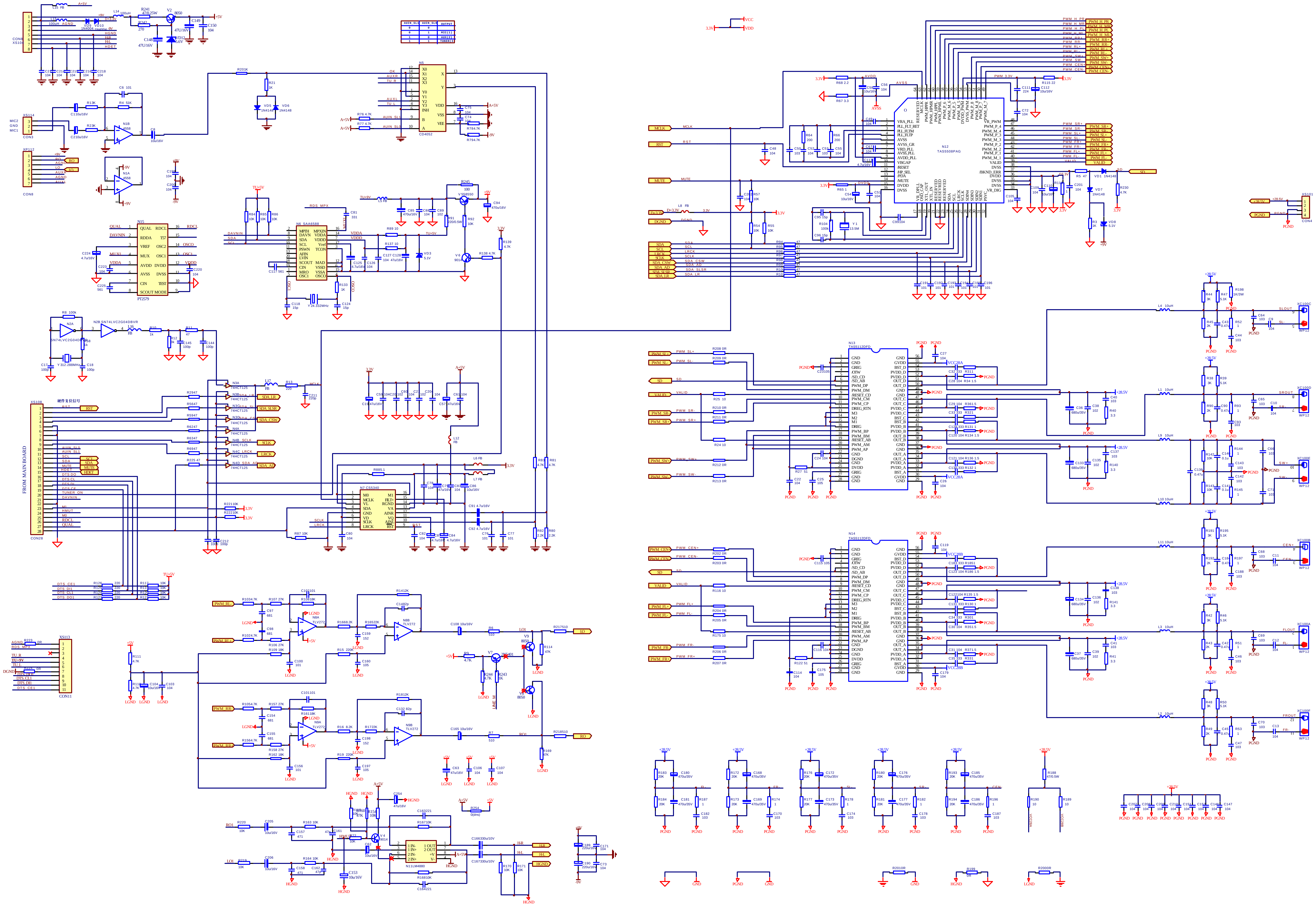
Section Two circuit diagram

5.2.1 DECODE&SERVO Board

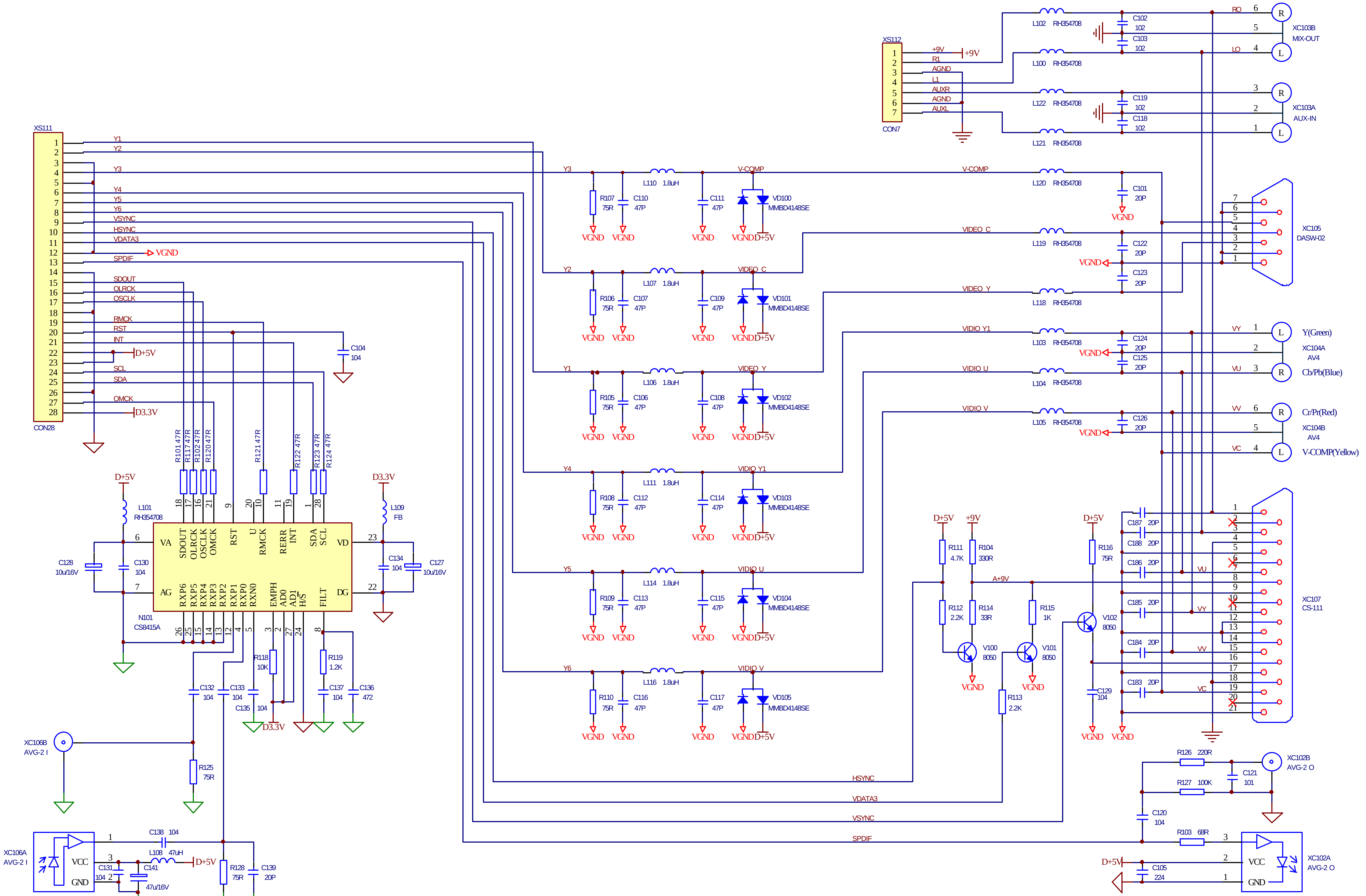



DV33
L226 FB
SD33
TC210 47uF/16V
C281 104
C2162 104
C2163 104
C2168 104
C2170 104
C2171 104
C2173 104
XP900
CON12
USBP
USBM
USB_VBUS
DV33
J4
J3
L230 FBSMT VFDAT
L231 FBSMT VFDST
L232 FBSMT VFDCK
L233 FBSMT IR
R230 4.7K
VCC
C263 47pF
C264 47pF
C265 47pF
C266 47pF
XS202
DV33
RXD
TXD
GND
C267 104
XS04(DNS)
U202
AT24C16X4050
DC/NC
RST_/NC
WP/RST_
VSS
VCC
RST/WP
SCL
SDA
R259 680R
R260 680R
C259 104
C260 102(DNS)
C261 102(DNS)
U211
SDRAM 64M
DMA0
DMA1
DMA2
DMA3
DMA4
DMA5
DMA6
DMA7
DMA8
DMA9
DMA10
MA11
BA0
#BA1
BA1
DMA11
R231 33R
R232 33R
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
BA0/A13
BA1/A12
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
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DCKE
R263
R264
33R
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SDCKE
CLK
CKE
CS#
RAS#
CAS#
WE#
R265
R266
R267
R2162
DCS#
DRAS#
DCAS#
DWE#
/CS
/RAS
/CAS
/WE
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DQM1
DQML
DQMH
NC
VSS
VCC
VCCQ
VSSQ
SD33
C2160 104
XP207
XS28
AUDIO_RST
SDATA0
SDATA1
SDATA2
GND
SACLK
SBCLK
SLRCK
AUIN_SL0
AUIN_SL1
SCL
SDA
SCMUTE
LRSWMUTE
DTS_DO
DTS_CL
DTS_DI
DTS_CE
TUNER_ON
DAVNIN
RDSSYNC
RDSID
RDSCE
RDCL
QUAL
ADC_DAT
VCC
R234 4.7K
R235 4.7K
R249 4.7K
XP206
Y1
Y2
Y3
Y4
Y5
Y6
VGND
HSYNC#
VSYNC#
VDATA3
R233 75R
IEC958
DGND
C282 104
SPDATA
SPLRCLK
SPBCLK
SPMCLK
R341
R342
R343
R344
R345
SPDAT
SPLRCK
SPBCK
SPMCK
AUDIO_RST
VOICE_DET
INT
VCC
L251 FB
DVCC
SCL
SDA
DGND
XO
DV33
VCC
DV33
DV33A
L227 FB
C272 104
TC213 220uF/16V
XP203
XS05
L222 FB
L223 FB
L209 FB
AVCC
C270 104
C271 104
TC208 220uF/16V
TC207 220uF/16V
VD
A21
A20
4.7K
0R
R238
R239
R240
R2140
R258
R257
R241 4.7K(DNS)
U214
8M_FLASH(TSOP)
A16
A15
A14
A13
A12
A11
A10
A9
AA20
AA21
DWR#
URST#
VP
A19
A18
A8
A7
A6
A5
A4
A3
A2
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DQ14
DQ6
DQ13
DQ5
DQ12
DQ4
Vcc
DQ11
DQ3
DQ10
DQ2
DQ9
DQ1
DQ8
DQ0
OE
CE
WE
RESET
RY/BY
A17
GND
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
DRD#
DCE#
U208
BA033FP(DNS)
IN
GND
OUT
ACLK
ABCK
ALRCK
ASDAT0
ASDAT1
ASDAT2
R291
R292
R293
R294
R295
R296
SACLK
SBCLK
SLRCK
SDATA0
SDATA1
SDATA2
XI
R244 0R
R246 100K
R248 0R
XO
X201 27MHz
C275 27pF
C276 27pF
L249 2.7uH(DNS)
C2158 27pF(DNS)
R250 0R(DNS)
IEC958
R251 0R
U205E HCU04
U205F HCU04
C274 104
R2159 0R
ASPDIF
VD202 1N4004(DNS)
VD203 1N4004(DNS)
U209
LM1117MP-1.8
V18
L228 FB
C273 104
TC209 220uF/16V
R242 3.3K
R243 1.2K
R347 10K
CLK
R346 330
C347 104
L216 FB
U203
RT9701
vin
vout
ce
GND
USB_VBUS
C348 104
C349 225
R348 10R(DNS)
R252 75K
VD201 1N4148
R236 1K
Q204 9015
R253 0R(DNS)
TC217 47uF/16V
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U205C HCU04
R256 33R
URST#

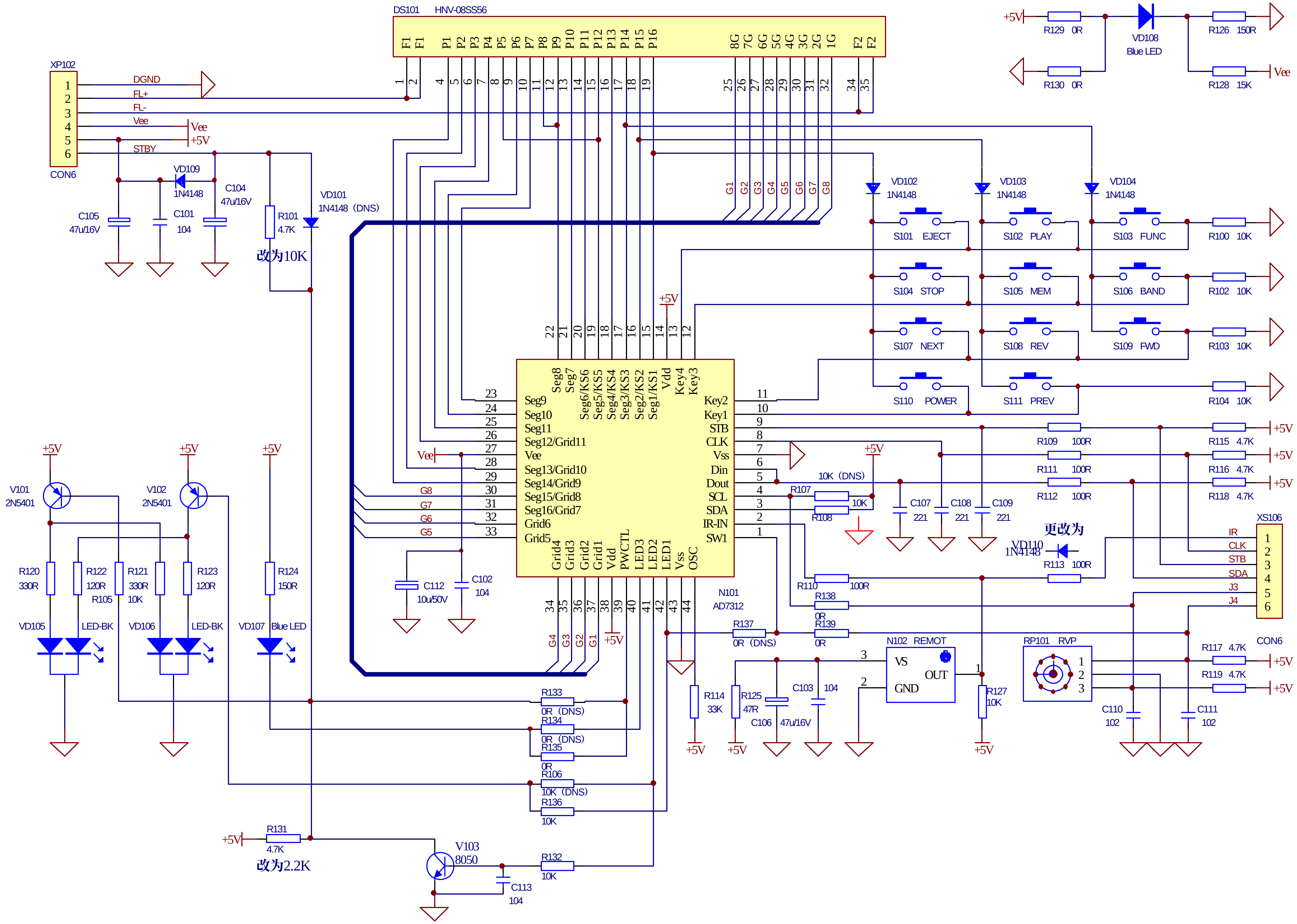
5.2.2 audio power amplifying Board



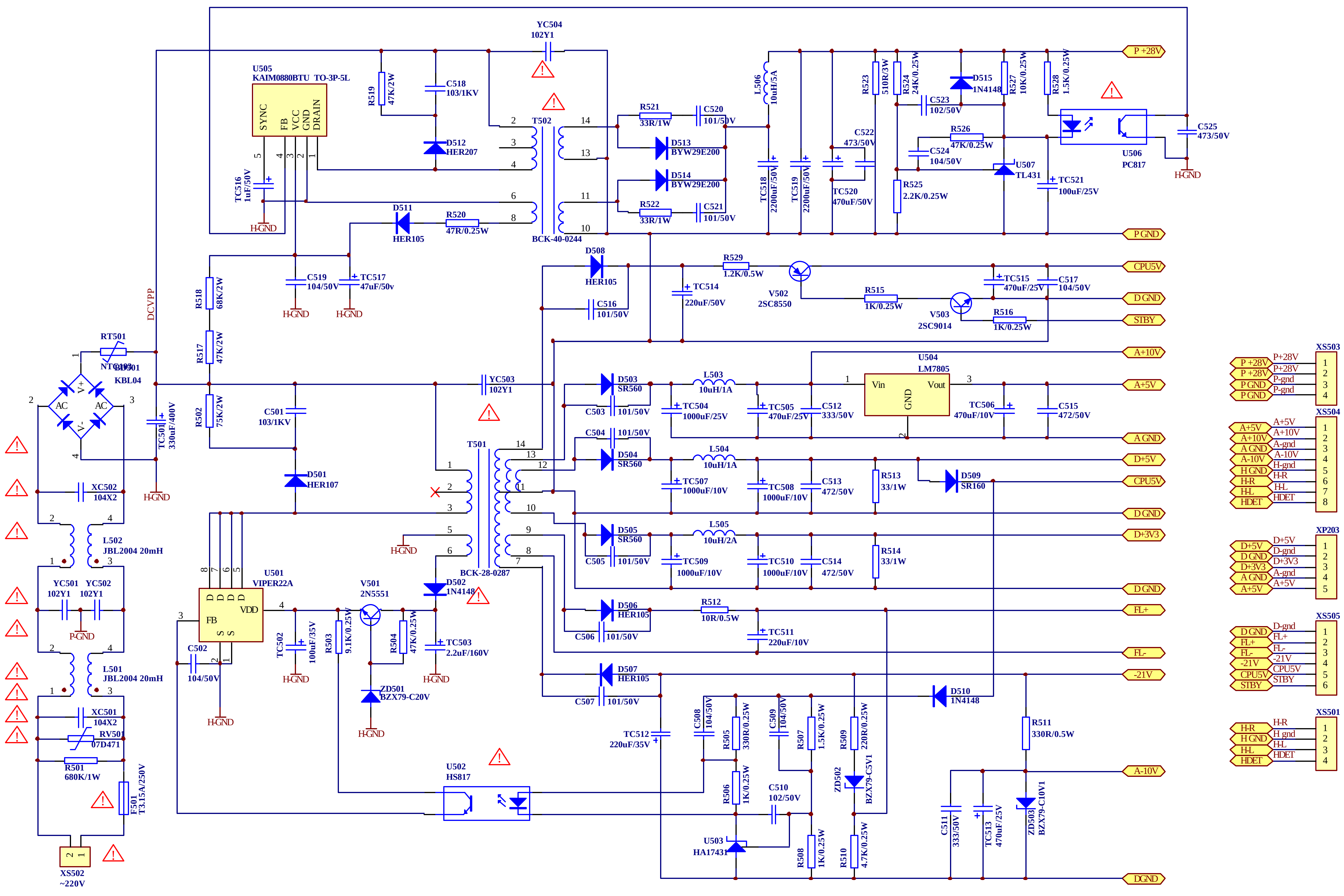
5.2.3 AV IN\OUT Board



5.2.4 KEY SCAN Board



5.2.5 PWOER Board



Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
DK1910SI（RU）SILVER WHITE			
MICROPHONE HOLDER BOARD		5446645	
1980030	MICROPHONE SOCKET	CK3-6.35-19	MIC1,MIC2
0000140	CARBON FILM RESISTOR	1/6W22K±5% SHAPED 7.5	R100,R101
0200174	PORCELAIN CAPACITOR	50V 103±10% 2.5mm	C101
2110329	LEAD	22# 70mm BLACK,WITH WELD PIECE	
2120534	FLAT CABLE	3P80 2.5 2 SOCKET WITH NEEDLE	XP114
1563711	PCB	91070-0	
DK1910SI（RU）SILVER WHITE			
AMPLIFIER BOARD:		5448507	
0000466	CARBON FILM RESISTOR	1/2W220O±5% SHAPED 12.5	R91
0000274	CARBON FILM RESISTOR	1/4W47O±5% SHAPED 10	R241
0000679	CARBON FILM RESISTOR	1/6W270O±5% SHAPED 7.5	R242
0010233	METAL OXIDE FILM RESISTOR	1/2W47O±5% SHAPED 12.5	R188
0210145	METAL POLYESTER FILM CAPACITOR	CL21X 100V 104K C5	C140,C141
0210165	METAL POLYESTER FILM CAPACITOR	CL23X 63V 474±5% 5	C42,C43,C45,C90,C139,C184
0010282	METAL OXIDE FILM RESISTOR	3W1K±5% SHAPED R 20×8	R198
0260127	CD	CD11 16V4.7U±20%5×11 2	C84,C87,C91,C92,C113,C224
0260019	CD	CD11 16V10U±20%5×11 2	C1,C2,C8,C54,C58,C62,C86,C104,C108,C110,C112,C165,C153,C205,C206
0260025	CD	CD11 16V47U±20%5×11 2	C19,C57,C63,C79,C128,C148,C149,C254
0260028	CD	CD11 16V220U±20%6×12 2.5	C189,C190
0260618	CD	CD11 10V330U±20%6.3×11 2.5	C166,C167
0260029	CD	CD11 16V470U±20%8×123.5	C94,C85
0260048	CD	CD11 35V470U±20%10×20 5	C168,C169,C172,C173,C176,C177,C180, C181,C185,C186
0260491	CD	CD11K 35V680U±20% 13×20 5	C36,C37,C133,C134
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L5,L8,L15
0410176	VERTICAL SCREEN SHIELD FILTERING INDUCTOR	10uH±10% 4A 5mm	L1~L4,L9~L11
0570004	DIODE	1N4004	VD9,VD10,R245
05800069	VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W BELT	VD8,VD3
05800339	VOLTAGE REGULATOR DIODE	5.6V±5% 1/2W BELT	VD12

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780032	TRIODE	9014C	V4
0780025	TRIODE	2N5401	V7
0780138	TRIODE	8050D	V2,V8,V9
0960226	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	4.332MHz 49-s	Y2
0960182	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	12.288MHz 49-S	Y3
0960171	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	13.50MHZ 49-S	Y1
0881743	IC	F4558 DIP	N1 ①
0880445	IC	4558C DIP	N1 ①
0882161	IC	AZ4558 DIP	N1 ①
0880124	IC	NJM4558D DIP	N1 ①
0881393	IC	IL4558N DIP	N1 ①
0881429	IC	CD4052BE DIP	N5 ②
0880443	IC	CD4052BCN DIP	N5 ②
1940003	SOCKET	4P 2.5mm	XS101
2150191	FLAT CABLE	7P200 2.5 T2 2×2P SHIELD,WITH NEEDLE,TOGETHER DIRECTION	XP112
1940009	SOCKET	8P 2.5mm	XS104
1940140	CABLE SOCKET	14P 1.0mm DUAL RANK STRAIGHT INSERT	XS108
1940033	CABLE SOCKET	11P 1.25mm DUAL RANK STRAIGHT INSERT	XS113
1990025	EXTERNAL SOURCES SOCKET	6PZ-7	XC100
0390168	INDUCTOR	100UH±10% 0410 SHAPED 12.5mm	L13,L14
1940002	SOCKET	3P 2.5mm	XS114
3580186	RADIATOR	78×49×30 DVR938 NOT OXIDATION	
5230707	SOFT SPONGE SPACER	10×10×2 SINGLE-FACED,HARD	
4490001	SPRING PAD	F 3	
4450012	BOLT PAD	F 3×7.2×0.5	
5230147	INSULATED PAD	F 8×3×0.8 WITHOUT GLUE IN REAR SIDE	
4210005	MACHINE-TAPPING SCREW	PM 3×8 BLACK	
5233174	RUBBER SPACER	9×9×1 SINGLE-FACED WITH GLUE IN REAR SIDE,CENTER HOLE f 3	
DK1910SI（RU）SILVER WHITE			
AMPLIFIER BOARD-SMD: 4DVR979-5 VER2.1			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R199~R213,R223,R254

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090272	SMD RESISTOR	1/16W 1Ο±5% 0603	R51~R53,R65,R93,R113,R144,R145,R174,R178,R182,R187,R196,R197
0090540	SMD RESISTOR	1/16W1.5Ο±5% 0603	R34~R37,R134~R136,R186
0090002	SMD RESISTOR	1/16W 2.2Ο ±5% 0603	R68
0090616	SMD RESISTOR	1/16W 3.3Ο±5% 0603	R40,R41,R67,R140,R141
0090314	SMD RESISTOR	1/16W 5.1Ο±5% 0603	R88
0090003	SMD RESISTOR	1/16W 10Ο±5% 0603	R24,R25,R89,R116,R137,R175
0090004	SMD RESISTOR	1/16W 22Ο±5% 0603	R115
0090230	SMD RESISTOR	1/16W 47Ο±5% 0603	R10,R13,R29,R56,R59,R62,R63,R69,R11,R94~R101,R225,R5
0090220	SMD RESISTOR	1/16W 51Ο±5% 0603	R27,R122
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R80,R82
0090239	SMD RESISTOR	1/16W 200Ο±5% 0603	R64,R66
0090008	SMD RESISTOR	1/16W 220Ο±5% 0603	R123~R126
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R3,R20,R21,R133,R243,R58
0090249	SMD RESISTOR	1/16W 510Ο±5% 0603	R6,R7,R217,R218
0090223	SMD RESISTOR	1/16W 2K±5%	R43,R45,R49,R90,R192
0090183	SMD RESISTOR	1/16W 3K±5% 0603	R38,R42,R44,R48,R191,R1,R2
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R76~R79,R81,R83,R102,R103,R105,R110,R111,R138,R139,R156,R230,R244
0090016	SMD RESISTOR	1/16W 1.5K±5% 0603	R9
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R39,R46,R47,R50,R195
0090022	SMD RESISTOR	1/16W 8.2K±5%	R166,R16
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R54,R55,R57,R84~R87,R92,R117,R119~R121,R142,R143,R163,R164,R167,R168,R170,R171,R154,R72
0090187	SMD RESISTOR	1/16W 12K±5% 0603	R14,R18
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R108,R109,R161,R162
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R172,R176,R180,R183,R193,R173,R177,R181,R184,R194
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R17,R165
0090027	SMD RESISTOR	1/16W 27K±5% 0603	R106,R107,R157,R158
0090192	SMD RESISTOR	1/16W 51K±5% 0603	R4
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R114,R169,R160,R118
0090201	SMD RESISTOR	1/16W 220K±5% 0603	R15,R19
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R8,R104
0090147	SMD RESISTOR	1/10W 1Ο±5% 0805	R30,R31,R32,R33,R130,R131,R132,R185

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090039	SMD RESISTOR	1/10W 10O±5% 0805	R189,R190
0310046	SMD CAPACITOR	50V 82P±5% NPO 0603	C14,C132
0310042	SMD CAPACITOR	50V 15P±5% NPO 0603	C95,C96,C118,C124
0310045	SMD CAPACITOR	50V 47P±5% NPO 0603	C144,C145,C211
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C6,C76,C77,C100~C102,C156,C191~C196,C17,C18,C212,C213
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C81
0310196	SMD CAPACITOR	50V 471±10% 0603	C157,C158
0310471	SMD CAPACITOR	50V 561±5% NPO 0603	C225
0310054	SMD CAPACITOR	50V 681±5% NPO 0603	C97,C98,C154,C155
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C20,C21,C38,C39,C89,C135,C136
0310067	SMD CAPACITOR	50V 152±10% X7R 0603	C159,C198
0310072	SMD CAPACITOR	50V 103±10% X7R 0603	C40,C41,C44,C46,C47,C50,C53,C64~C66,C68~C71,C93,C137,C138,C142,C143,C170,C174,C178,C182,C187,C188
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C9~C13,C22,C24,C26~C31,C48,C49,C51,C52,C55,C56,C59~C61,C67,C72~C75,C78,C80,C82,C83,C88,C99,C103,C105~C107,C109,C114,C116,C119~C123,C223,C127,C179,C199,C200~C202,C204,C150,C171 ③
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C9~C13,C22,C24,C26~C31,C48,C49,C51,C52,C55,C56,C59~C61,C67,C72~C75,C78,C80,C82,C83,C88,C99,C103,C105~C107,C109,C114,C116,C119~C123,C223,C127,C179,C199,C200~C202,C204,C150,C171 ③
0310112	SMD CAPACITOR	16V 224±10% 0603	C111
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	C160,C197
0310673	SMD CAPACITOR	50V 333±5% X7R 0603	C32~C35,C129,C130,C131,C183
0310368	SMD CAPACITOR	25V 105 +80%-20% Y5V 0805	C23,C25,C115,C175
0390355	SMD INDUCTOR	4.7UH±10% 1608	R219,R220
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L6,L12,L16,L17
0700007	SMD DIODE	1N4148	VD1,VD5,VD6,VD7
0882353	IC	CS5340 TSSOP	N7
0882946	IC	PT2579-SN SOP	N15
0882349	IC	TAS5112 TSSOP	N13,N14
0882350	IC	TAS5508 TQFP	N12
0882352	IC	TLV272 SOP	N8,N9

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0882920	IC	SN74LVC125APWR TSSOP	N3,N4
0882373	IC	SN74LVC2G04DBVR SOT-23	N2
0882398	IC	LM4880M SOP	N11
1633181	PCB	4DVR979-5	
DK1910SI（RU）SILVER WHITE			
DECODE BOARD：2DK1910S-1 Ver2.5			
0000375	CARBON FILM RESISTOR	1/4W2.2O±5%	R326
02604379	CD	CD11 16V10U±20%5×11C5 BELT	TC202
02600019	CD	CD11 16V22U±20%5×11 C5 BELT	TC217
02601819	CD	CD11 16V220U±20%6×12 C5 BELT	TC207~TC209,TC213
0260028	CD	CD11 16V220U±20%6×12 2.5	TC211,TC301
02600029	CD	CD11 16V47U±20%5×11 C5 BELT	TC205,TC203,TC204,TC247,TC248,TC237,TC304,TC308,TC309
0260200	CD	CD11C 16V47U±20%5×7 2	TC302,TC303,TC206,TC201,TC210
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L209,L222,L223,L302,L250
07801389	TRIODE	8050D BELT	V307,V308 ④
07800299	TRIODE	C8050 BELT	V307,V308 ④
07801519	TRIODE	8550D BELT	V306,V309 ⑤
07800309	TRIODE	8550C BELT	V306,V309 ⑤
07800339	TRIODE	9015C(200-600) TO-92 BELT	Q204
0960020	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	27.00MHz 49-S	X201
1940140	CABLE SOCKET	14P 1.0mm DUAL RANK STRAIGHT INSERT	XP206
1940261	CABLE SOCKET	14P 1.0mm DUAL RANK TOUCH POINT,DUAL RANK FLEX INSERT	XP207
2121685	FLAT CABLE	5P230 2.5/2.0 2 PIN,WITH L NEEDLE,TOGETHER DIRECTION	XP203
2121686	SOFT FLAT CABLE	6P240 2.0 2 PIN,WITH L NEEDLE,REVERSE	XS303
2121687	SOFT FLAT CABLE	5P300 2.0 2 PIN,WITH L NEEDLE,TOGETHER DIRECTION	XS302
2122001	FLAT CABLE	12P280 2.0 2 PIN,WITH L NEEDLE,TOGETHER DIRECTION	XP900
DK1910SI（RU）SILVER WHITE			
DECODE BOARD-SMD： 2DK1910S-1 Ver2.5			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R201~R204,R244,R248,R251,R255,R297,R298,R299,R331,R228,R303,R318,R2165,R2166,R257,R258,R2159
0090006	SMD RESISTOR	1/16W 75O±5% 0603	R233

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090272	SMD RESISTOR	1/16W 1O±5% 0603	R304~R307,R321,R340
0090003	SMD RESISTOR	1/16W 10O±5% 0603	R301,R302
0090005	SMD RESISTOR	1/16W 33O±5% 0603	R232,R256,R261,R263,R264,R268,R292~R296,R231,R265~R267,R2162,R341~R344
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R291
0090011	SMD RESISTOR	1/16W 470O±5% 0603	R325,R327
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R213,R236
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R254
0090016	SMD RESISTOR	1/16W 1.5K±5% 0603	R323,R324,R243
0090249	SMD RESISTOR	1/16W 510O±5% 0603	R214
0090018	SMD RESISTOR	1/16W 3.3K±5% 0603	R242
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R238~R240,R234,R235,R249,R230,R2140
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R208,R309,R311,R313,R314,R339,R328,R329,R259,R260,R349,R347
0090030	SMD RESISTOR	1/16W 56K±5% 0603	R252
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R209,R223
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R211,R312,R315,R316
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R210
0090197	SMD RESISTOR	1/16W 150K±5% 0603	R319,R320
0090231	PRECISION SMD RESISTOR	1/16W 680K±1% 0603	R317,R322
0090319	PRECISION SMD RESISTOR	1/16W 750K±1% 0603	R227
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R224,R308,R310,R246
0090111	SMD RESISTOR	1/10W 4.7O±5% 0805	L206
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C222
0310190	SMD CAPACITOR	50V 27P±5% NPO 0603	C275,C276
0310045	SMD CAPACITOR	50V 47P±5% NPO 0603	C263~C266
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C212,C213
0310048	SMD CAPACITOR	50V 151±5% NPO 0603	C304,C306
0310222	SMD CAPACITOR	25V 104±20% X7R 0603	C207,C211,C214,C216,C217,C224,C227~C231,C234~C239,C241~C251,C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C343~C345,C347,C348 ⑥

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C207,C211,C214,C216,C217,C224,C227~C231,C234~C239,C241~C251,C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C343~C345,C347,C348 ⑥
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C207,C211,C214,C216,C217,C224,C227~C231,C234~C239,C241~C251,C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C343~C345,C347,C348 ⑥
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	C201~C204,C221,C240
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C223
0310566	SMD CAPACITOR	10V 225 +80%-20% Y5V 0603	C278,C349
0310068	SMD CAPACITOR	50V 222±10% X7R 0603	C307,C310
0310201	SMD CAPACITOR	50V 153±10% X7R 0603	C210
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C233,C282
0310055	SMD CAPACITOR	16V 333±10% X7R 0603	C225
0310056	SMD CAPACITOR	16V 473±10% X7R 0603	C219,C220
0310362	SMD CAPACITOR	16V474 +80%-20% Y5V 0603	C218
0310245	SMD CAPACITOR	50V 121±10% X7R 0603	C206
0390163	SMD INDUCTOR	3.3uH±10% 1608	L249
0390087	SMD MAGNETIC BEADS	FCM2012V-221T07	L201,L203,L205,L207,L208,L226,L227,L234,L235,L238
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L309,L228,L236,L230~L233,L301,L305,L307,L310,L312,L314,L316,L317,L320,L304,L308,L318,L322,L324,L311,L321,L251,L303,L306,L216
0390170	SMD INDUCTOR	10UH±10% 1608	L319,L323
0700007	SMD DIODE	1N4148	VD201 ⑦
0700001	SMD DIODE	LS4148	VD201 ⑦
0700002	SMD DIODE	LL4148	VD201 ⑦
0780062	SMD TRIODE	9014C	V310
0780040	SMD TRIODE	3904(100-300) SOT-23	V305
0780193	SMD TRIODE	2SK3018	V303,V304
0780115	SMD TRIODE	2SB1132	V301,V302
0880165	IC	74HCU04D SOP	U205 ⑧
0880322	IC	MM74HCU04M SOP	U205 ⑧

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0880513	IC	HCU04 SOP	U205 ⑧
0881157	IC	HY57V641620HGT-H TSOP	U211 ⑨
0881661	IC	IC42S16400-7T TSOP	U211 ⑨
0881969	IC	IP1117-ADJ SOT-223	U209 ⑩
0881182	IC	LM1117MP-ADJ SOT-223	U209 ⑩
0881079	IC	AT24C04 SOP	U202
0882644	IC	MT1389FE/H(HD) QFP	U201
0881459	IC	D5954 SOP	U302 ⑪
0881378	IC	BA5954FP HSOP	U302 ⑪
0881914	IC	RT9701CB SOT25	U203
1940228	CABLE SOCKET	24P 0.5mm SMD,NEXT MEET WITH CLASP	XS301
1633380	PCB	2DK1910S-1	
DK1910SI（RU）SILVER WHITE			
EARPHONE BOARD:		5448508	
0090237	SMD RESISTOR	1/16W 39O±5% 0603	R17,R18
0090028	SMD RESISTOR	1/16W 33K±5% 0603	R19,R20
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C10 ⑫
0310222	SMD CAPACITOR	25V 104±20% X7R 0603	C10 ⑫
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C10 ⑫
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L1,L2,L5
2120535	FLAT CABLE	4P60 2.5 2 SOCKET WITH NEEDLE	XP103
2120463	FLAT CABLE	6P80 2.5 2 SOCKET WITH NEEDLE	XP106
1940175	SOCKET	12P 2.0mm STRAIGHT INSERT	XS1
1860135	USB SOCKET	3DHM04S-30N-C	JK1
1980061	EARPHONE SOCKET	CKX-3.5-01K	CK1
1633546	PCB	C1910-3	
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R21
DK1910SI（RU）SILVER WHITE			
INPUT OUTPUT BOARD		5446095	
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L100~L105,L118~L122
0390147	INDUCTOR	47UH±5% 0410 SHAPED 10mm	L108
0260019	CD	CD11 16V10U±20%5×11 2	C127,C128

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0260025	CD	CD11 16V47U±20%5×11 2	C141
1910158	TERMINAL SOCKET	AV4-8.4-13	XC103
1910194	TERMINAL SOCKET	AV4-8.4-13/PB-08B	XC104
1860059	SCART SOCKET	CS-111	XC107
1910159	TERMINAL SOCKET	CS TERMINAL DASW-02	XC105
1910195	TERMINAL SOCKET	AVG-2-07 BLACK	XC102,XC106
1090071	OPTIC-ELECTRO CONVERTOR	RX179AT	XC106
1090077	ELECTRO-OPTIC TRANSFORMER	TX179AT-2	XC102
1940007	SOCKET	7P 2.5mm	XS112
1940140	CABLE SOCKET	14P 1.0mm DUAL RANK STRAIGHT INSERT	XS111
5446090	PCB SEMI-FINISHED PRODUCT	7979-0-SMD DK1050S(RU)	
DK1910SI（RU）SILVER WHITE			
INPUT OUTPUT BOARD-SMD		5446090	
0090005	SMD RESISTOR	1/16W 33O±5% 0603	R114
0090230	SMD RESISTOR	1/16W 47O±5% 0603	R101,R102,R117,R120~R124
0090238	SMD RESISTOR	1/16W 68O±5% 0603	R103
0090006	SMD RESISTOR	1/16W 75O±5% 0603	R105~R110,R116,R125,R128
0090008	SMD RESISTOR	1/16W 220O±5% 0603	R126
0090009	SMD RESISTOR	1/16W 330O±5% 0603	R104
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R115
0090015	SMD RESISTOR	1/16W 1.2K±5% 0603	R119
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R112,R113
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R111
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R118
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R127
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C101,C122~C126,C139,C183~C188
0310045	SMD CAPACITOR	50V 47P±5% NPO 0603	C106~C117
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C102,C103,C118,C119
0310198	SMD CAPACITOR	50V 472±10% X7R 0603	C136
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C104,C120,C129~C135,C137,C138
0310723	SMD CAPACITOR	16V 224±10% X7R 0603	C105
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L109

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390096	SMD INDUCTOR	1.8UH±10% 1608	L106,L107,L110,L111,L114,L116
0700056	SMD DOUBLE DIODE	MMBD4148SE SOT-23	VD100~VD105
0780085	SMD TRIODE	8050D	V100~V102
0882413	IC	CS8415A TSSOP	N101
1632105	PCB	7979-1	
DK1910SI（RU）SILVER WHITE			
POWER BOARD:		5448506	
2100003	LEAD	F 0.6 SHAPED 7.5mm	W1,W2,W9,W10,W16,W17,W22
2100004	LEAD	F 0.6 SHAPED 10mm	W4,W7,W11,W12,W14,W18,W21
2100006	LEAD	F 0.6 SHAPED 12.5mm	W5,W6
2100007	LEAD	F 0.6 SHAPEN 15mm	W3,W15,W19,W20
2100016	LEAD	F 0.6 SHAPEN 18mm	W8,W13
2100017	LEAD	F 0.6 SHAPED 20mm	W23
0000274	CARBON FILM RESISTOR	1/4W47O±5% SHAPED 10	R511
0000431	CARBON FILM RESISTOR	1/4W75O±5% SHAPED 10	R503
0000432	CARBON FILM RESISTOR	1/4W150O±5% SHAPED 10	R517
0000362	CARBON FILM RESISTOR	1/4W220O±5% SHAPED 10	R521
0000277	CARBON FILM RESISTOR	1/4W300O±5% SHAPED 10	R505
0000278	CARBON FILM RESISTOR	1/4W330O±5% SHAPED 10	R523
0000283	CARBON FILM RESISTOR	1/4W1K±5% SHAPED 10	R518
0000361	CARBON FILM RESISTOR	1/4W1.2K±5% SHAPED 10	R514
0000284	CARBON FILM RESISTOR	1/4W1.5K±5% SHAPED 10	R506,R533
0000460	CARBON FILM RESISTOR	1/4W3K±5% SHAPED 10	R540
0000289	CARBON FILM RESISTOR	1/4W4.7K±5% SHAPED 10	R522
0000294	CARBON FILM RESISTOR	1/4W10K±5% SHAPED 10	R515,R524,R532,R537,R536
0000299	CARBON FILM RESISTOR	1/4W22K±5% SHAPED 10	R513
0000423	CARBON FILM RESISTOR	1/4W30K±5% SHAPED 10	R504
0000301	CARBON FILM RESISTOR	1/4W47K±5% SHAPED 10	R531
0010270	METAL FILM RESISTOR	1/4W1.8K±1% SHAPED 10	R519
0010140	METAL FILM RESISTOR	1/4W3K±1% SHAPED 10	R520
0010062	METAL FILM RESISTOR	1/4W2.2K±1% SHAPED 10	R529
0010273	METAL FILM RESISTOR	1/4W24K±1% SHAPED 10	R530

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0010138	METAL OXIDE FILM RESISTOR	1W330O±5% SHAPED FLAT 15×9	R525
0010294	METAL OXIDE FILM RESISTOR	1W750K±5% FLAT 12.5×7	R512
0010259	METAL OXIDE FILM RESISTOR	1W0.47O±5% FLAT 12.5×7	R534,R535
0010165	METAL OXIDE FILM RESISTOR	1W1O±5%SHAPED FLAT 15×7	R507,R516
0010191	METAL OXIDE FILM RESISTOR	1W33O±5%SHAPED FLAT 15×8	R526,R527
0010279	METAL OXIDE FILM RESISTOR	1W680K±5% SHAPED 15	R501
0010295	METAL OXIDE FILM RESISTOR	2W10O±5% SHAPED VERTICAL 7.5	R539
0010219	METAL OXIDE FILM RESISTOR	2W10O±5% SHAPED FLAT 15×7	R538
0010147	METAL OXIDE FILM RESISTOR	2W47K±5% SHAPED FLAT 15×7	R508,R510
0010157	METAL OXIDE FILM RESISTOR	2W68K±5%SHAPED FLAT 15×7	R509
0010263	METAL OXIDE FILM RESISTOR	2W75K±5% SHAPED FLAT 15×7	R502
0010282	METAL OXIDE FILM RESISTOR	3W1K±5% SHAPED R 20×8	R528
0200105	PORCELAIN CAPACITOR	50V 100P±10% 5mm	C507,C510,C513,C515,C517,C518,C523, C524
0200123	PORCELAIN CAPACITOR	50V 102±10% 5mm	C527,C503
0200138	PORCELAIN CAPACITOR	50V 104±20% 5mm	C504,C508,C519,C520,C521,C526
0200223	PORCELAIN CAPACITOR	1000V 101 +80%-20% 7.5mm	C502
0200224	PORCELAIN CAPACITOR	1000V 103 +80%-20% 7.5mm	C501,C505
0210148	TERYLENE CAPACITOR	100V 473±10% SHAPED 5mm	C509,C511,C512,C514,C516,C522,C525, C528,C506
0210116	ANTI-JAMMING CAPACITOR	MKP61 X2 275VAC 104±20%15	XC501,XC502
0200343	CERAMIC CAPACITOR	Y1 400VAC 102±10% 10mm	YC501,YC502,YC503
0260749	CD	EZ 400V220U±20% 30×30 10	TC501
0260655	CD	CD288H 16V220U±20% 8×12 3.5	TC513
0260656	CD	CD288H 16V470U±20% 10×12 5	TC508,TC520
0260657	CD	CD288H 16V1000U±20% 10×20 5	TC507,TC510,TC512
0260661	CD	CD288H 16V2200U±20%13×20 5	TC506,TC509,TC511
0260662	CD	CD288H 25V470U±20%10×16 5	TC515
0260659	CD	CD288H 35V220U±20%10×12 5	TC514
0260660	CD	CD288H 50V1U±20%5×11 2	TC503
0260672	CD	CD288H 50V47U±20%6.3×11 2.5	TC502,TC504,TC505
0260673	CD	CD288H 50V470U±20%13×20 5	TC518
0260751	CD	CD11K 50V1000U±20%16×25 7.5	TC516,TC517
0390340	VERTICAL INDUCTOR	10uH±10% 5A 12.5×26.5 10mm	L508

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390154	MAGNETIC BEADS INDUCTOR	RH-357508	L503
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	L504,L505,L506
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	L507
1000038	FILTER OF POWER NET	SE1989 20mH +∞-0%	L501,L502
0460481	SWITCH POWER TRANSFORMER	BCK-28-0598	T501 (13)
0460482	SWITCH POWER TRANSFORMER	SE2017	T501 (13)
0460454	SWITCH POWER TRANSFORMER	BCK-40-0244	T502 (14)
0460441	SWITCH POWER TRANSFORMER	BCK-40-0726	T502 (14)
0680026	SCHOTTKY DIODE	SR160	D515
0680065	SCHOTTKY DIODE	SR560 DO-27 SHAPED 20mm	D510,D511
0680078	SCHOTTKY DIODE	SR3A0 DO-27 SHAPED 17.5	D509
0570006	DIODE	1N4148	D508,D514
0570013	DIODE	HER105	D503,D504,D506,D507,D512,D513
0570014	DIODE	HER107	D501,D502
0570042	DIODE	HER207 SHAPED 12.5mm	D505
0570045	DIODE	BYW29E-200 TO-220	D516,D517 (15)
0570047	DIODE	ER802 GOLD SEALED TO-220	D516,D517 (15)
05800069	VOLTAGE REGULATOR DIODE	5.1V 1/2W BELT	ZD501
0580072	VOLTAGE REGULATOR DIODE	9.1V±5% 1W SHAPED 10mm	ZD502
0570032	DIODE	1N5408	D520,D521,D522,D523
0790061	SMD FIELD EFFECT TRANSISTOR	IRFBC20 PLASTIC SEALED TO-220	V501
0780026	TRIODE	2N5551	V502,V503,V504
0690001	CONTROLLABLE SILICON	MCR100-6	Q501
0880379	IC	LM7805 GOLD SEALED TO-220	U508 (16)
0880247	IC	MC7805CT GOLD SEALED TO-220	U508 (16)
0880499	IC	L7805CV GOLD SEALED TO-220	U508 (16)
0880553	IC	LM431ACZ TO-92	U503,U506 (17)
0882089	IC	TL431 TO-92	U503,U506 (17)
0882462	IC	AZ431AZ-A TO-92	U503,U506 (17)
0882041	IC	MIK431C TO-92	U503,U506 (17)
0881480	IC	NCP1200P60 DIP	U501
0881500	IC	KA1M0880BTU TO-3P-5L	U504

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1030007	PRESS SENSITIVITY RESISTOR	7D 471±10% 5mm	RV501
1050002	HEAT SENSITIVITY RESISTOR	NTC SCK-104MS±20%	RT501
1080011	PHOTOELECTRIC COUPLER	HS817	U502,U505,U507
1570182	PCB	@5DVR979N-8 UL	
1940003	SOCKET	4P 2.5mm	XS101,XS103
1940004	SOCKET	5P 2.5mm	XS105
1940006	SOCKET	6P 2.5mm	XS102
1940009	SOCKET	8P 2.5mm	XS104
1940074	SOCKET	2P 7.92mm	XS100
2300004	FUSE	T3.15AL 250V	F501
3020402	FUSE HOLDER	BLX-2	F501
3580086	HEAT RADIATION BOARD	11×15×25 BLACK SINGLE HOLE	D516,D517,V501
3580091	HEAT RADIATION BOARD	11×15×31 LFDR9905	U508
3580156	HEAT RADIATION BOARD	40×20×35 DVR938-2	U504
3870115	GROUND CHIP OF POWER BOARD	AB903	GND501,GND502
4000453	SELF-TAPPING SCREW	BT 3×8H WHITE NICKEL	V501,U508,D516,D517
4000564	SELF-TAPPING SCREW	PWT 3×12×7H WHITE NICKEL	U504
4000627	SELF-TAPPING SCREW	PWT 2.6×6×5H BLACK ZINC	
DK1910SI（RU）SILVER WHITE			
REMOTE CONTROL		5471746	
0310222	SMD CAPACITOR	25V 104±20% X7R 0603	C3 ,C5
0310191	SMD CAPACITOR	50V 30P±5% NPO 0603	C1, C2
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R2
0090233	SMD RESISTOR	1/16W 4.7MO±5% 0603	R3, R4
0090002	SMD RESISTOR	1/16W 2.2O ±5% 0603	R5
0700007	SMD DIODE	1N4148	VD2
0970008	CERAMIC RESONATOR	2.0MHz	G1
0090008	SMD RESISTOR	1/16W 220O±5% 0603	R6
0260008	CD	CD11C 10V47U±20%4×7 1.5	TC1
0630003	EMISSION PIPE	TSAL6200	LED1
0160217	DIGITAL POTENTIOMETER	EC30P16	RP1
1340190	LIGHT TOUCH SWITCH(FIVE DIRECTION)	SKQUCAA010	RP2

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780085	SMD TRIODE	8050D	V1
1564473	PCB	81910SI-2	
2100003	LEAD	F 0.6 SHAPED 7.5mm	W1
3031855	SURFACE CASING OF REMOTE CONTROL	RC-073 BLACK	
3041406	BOTTOM CASING OF REMOTE CONTROL	RC-073 BLACK	
3051348	BATTERY CASE DOOR OF REMOTE CONTROL	RC-073 BLACK	
3051349	GLASS OF REMOTE CONTROL	RC-073 MING PURPLE	
3850124	ANODE SPRING	RC026	
3850125	CATHODE SPRING	RC026	
3850126	ANODE/CATHODE SPRING	RC026	
3072572	5-DIRECTION BUTTON	RC-073 GREEN	
3072570	VOLUME KNOB	RC-073 BLACK	
4000179	SELF-TAPPING SCREW	PB 2×8 BLACK	
0890292	PROGRAM CPU	CPURC073RU-0	
4631058	CONDUCT GLUE OF REMOTE CONTROL(UPPER)	RC-073	
4631059	CONDUCT GLUE OF REMOTE CONTROL(LOWER)	RC-073	
5071274	GLUE BAG FOR ENVIRONMENTAL PROTEETION（WITHOUT HOLE）	85×290×0.05 PE	
DK1910SI（RU）SILVER WHITE			
SURFACE CONTROL BOARD:		5448509	
0000619	CARBON FILM RESISTOR	1/6W120O±5% SHAPED 7.5	R122,R123
0000452	CARBON FILM RESISTOR	1/6W150O±5% SHAPED 7.5	R124,R126
0000123	CARBON FILM RESISTOR	1/6W330O±5% SHAPED 7.5	R120,R121
0260075	CD	CD11 50V10U±20%5×11 2	C112
0260025	CD	CD11 16V47U±20%5×11 2	C104,C105,C106
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD107,VD108
0620078	DUAL COLOR RADIATION DIODE	3RB9SW03 RED BLUE	VD105,VD106
0881944	PCB	AD7312 QFP	N101
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	S102,S104~S111
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6×6×1	S101,S103
0160201	DIGITAL POTENTIOMETER	EC12P24L25F12	RP101

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
2360021	IR SENSOR	AT138BV3	N102
1200653	DISPLAY SCREEN	HL-D593	DS101 (18)
1200532	DISPLAY SCREEN	HNV-08SS56	DS101 (18)
1200531	ISPLAY SCREEN	VFD16-0801	DS101 (18)
2121688	FLAT CABLE	6P100 2.5 2 PIN,WITH NEEDLE,TOGETHER DIRECTION	XP102
1940006	SOCKET	6P 2.5mm	XS106
5233341	SOFT SPONGE SPACER	10×10×8 DOUBLE-FACED,HARD(35 DEGREE)	
DK1910SI（RU）SILVER WHITE			
SURFACE CONTROL BOARD-SMD: 6DK1910S-2 VER 2.3			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R129,R135,R138,R139
0090230	SMD RESISTOR	1/16W 47O±5% 0603	R125
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R109~R112
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R115~R119
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R131
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R100,R102~R105,R108,R127,R132,R136, R140
0090192	SMD RESISTOR	1/16W 51K±5% 0603	R114
0310195	SMD CAPACITOR	50V 221±10% X7R 0603	C107,C108,C109
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C110,C111
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C101,C102,C103,C113
0700007	SMD DIODE	1N4148	VD102~VD104,VD109,VD110
0780271	SMD TRIODE	2N5401 SOT-23	V101,V102
0780085	SMD TRIODE	8050D	V103
1633467	PCB	6DK1910S-2	
0090021	SMD RESISTOR	1/16W 6.8K±5% 0603	R101
DK1910SI（RU）SILVER WHITE			
PROGRAM FLASH ROMDK1910SIRU-0A(16M) 0911715			
0881998	IC	AT49BV162A 70TI TSOP	U214 (19)
0881754	IC	29LV160BE-70NC TSOP	U214 (19)
DK1910SI（RU）SILVER WHITE			
PROGRAM CPURCO73RU-0 0890292			
0883034	IC	M37544G2AGP LQFP	N1
5156608	SIGN STICKER	CPURC073RU-0	